Trading Places: Securities Regulation, Market Crisis, and Network Risk

Olufunmilayo B. Arewa
TRADING PLACES
SECURITIES REGULATION, MARKET CRISIS, AND NETWORK RISK

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Abstract

The rising power of traders has fundamentally transformed financial market networks and risks. Further, the increased complexity of traded securities and trading strategies within financial networks has magnified shortcomings of existing industry risk management practices as well as dominant regulatory regimes. Financial markets are ultimately places where people trade. Broader social and technological changes have altered the nature of trading activities in financial markets. Innovations in technology, financial instruments, and trading strategies have increased financial market efficiency but have also transformed sources of financial market risks. Financial market networks heighten the need for fundamental rethinking of financial market regulation and reassessment of ways both regulators and market participants can better manage risk. This article evaluates the importance of financial networks and related factors such as globalization, complexity, and secrecy for financial markets. This article argues that, as recommended in a recent Department of Treasury Blueprint for future financial market regulation, U.S. adoption of a modified “Twin Peaks” model of regulation may provide for more efficient and effective regulation of financial market activities and risk and help avoid future market crises. This model would move portions of regulatory oversight of existing functional regulators such as the Securities and Exchange Commission into new regulatory bodies that regulate by objective and would establish a separate regulatory function for market risk and market stability oversight. Adoption of this model, combined with the establishment of specific core financial market regulatory principles, should enable regulators and market participants to manage risk more effectively.

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INTRODUCTION

Traders increasingly rule global financial markets.1 The increased power of traders in settings such as hedge and private equity funds, as well as internally within investment banks and other financial institutions is one indication of significant financial market changes.2 This trading ethos means that financial assets “now change hands with dizzying speed,”3 leading to an expectation of active trading and the buying and selling of financial instruments as a norm for a broad range of market participants. Traditional money managers, for example, have moved from

1 EDWARD CHANCELLOR, DEVIL TAKE THE HINDMOST: A HISTORY OF FINANCIAL SPECULATION 253 (2000) (“By the early 1980s, traders were running Wall Street.”); Karin Knorr Cetina & Urs Bruegger, Global Microstructures: The Virtual Societies of Financial Markets, 107 AM. J. SOCIOLOGY 905, 912 (2002) (“Financial markets, however, are primarily concerned with neither the production of goods nor their distribution to clients, but with trade—the trading of currencies and financial instruments not for consumption.”).

2 CHANCELLOR, supra note 1, at 254 (describing the rise of traders as an international phenomenon and a product of deregulation and globalization); MCKINSEY & COMPANY, THE NEW POWER BROKERS: HOW OIL, ASIA, HEDGE FUNDS AND PRIVATE EQUITY ARE SHAPING GLOBAL CAPITAL MARKETS 19 (2007) (discussing new power brokers in global capital markets, two of which are hedge funds and private equity).

a model of management based on trust to one based on market transactions. This market transaction focused model has become more trading oriented as money managers strive to meet investor expectations of short-term results measured by the quarter rather than the longer investment horizons that had been typical in the past. Since the late 1970s, even insurance companies have developed more of a trading mentality. Active traders in hedge funds may pursue complex trading strategies that involve thousands of trades. Similarly, prior to the credit crisis, traders had become increasingly powerful in investment banks, many of which have in recent years made most of their profits from trading rather than the investment banking and advisory services that had once been a dominant source of revenue. Current U.S. financial market regulation frameworks have not kept pace with continuing financial innovations. As a result, regulators are not able to give adequate risk oversight to trading and other activities that are increasingly characteristic of financial markets.

Transactions made by traders form a critical part of pervasive financial market networks. Such networks may exist on multiple levels and may include knowledge networks that embed technology infrastructures, as well as interconnections among individuals within firms and firms themselves. These interconnections link market participants during both financial market expansions and contractions. Risk arising from the connectivity of financial market participants, or network risk, is a key aspect of what makes the costs of negative financial contagion potentially so high. Although subject to varied definitions, systemic risk is risk of a shock to the financial system that “significantly impairs crucial functions such as asset valuation, credit allocation, payments, and settlements and that imposes significant costs on the real economy.”

Network risk draws attention to the interactions among market participants and is another lens by which to consider systemic risk. Network risk thus encompasses risks that arise from

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4 Michael Lounsbury, Expertise and Industry Transformation: Money Management in the U.S. Mutual Fund Industry, at 3-5, Jan. 2003, Presentation, American Sociological Association Meeting (describing how the money manager profession was transformed during the twentieth century from a craft based vocation based on an apprenticeship system focused on conservative long-term investing to an industry based on financial economics in which professionals manage portfolios with a dominant market logic that focuses on short-term performance).

5 Id. (noting shift from long-term to short-term investing among money managers).

6 Robert Sobel, Dangerous Dreamers: The Financial Innovators from Charles Merrill to Michael Milken 125 (1993) (noting that since the late 1970s even insurance companies had more of a trading mentality).

7 Knorr Cetina & Bruegger, supra note 1 (discussing in ethnographic study the forms of coordination and communication evident in trading relationships).

8 Federal Reserve Bank of New York (FRBNY), Payment Risks Subcommittee, Financial Market Infrastructure Risk, at 4, May 2007 (“Global banks are critically reliant on financial infrastructure networks to support their core payments, trading, clearing and custody activities.”)

9 Steven L. Schwarz, Systemic Risk, 97 Geo. L. J. 193, 196 (2008) (“[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.”).


11 FRBNY, supra note 8, at 7 (describing systemic risk as risk that comes about due to linkages in financial market infrastructures and that default in one such infrastructure “can have a ‘domino’ effect on another network resulting in a cascading series of defaults and failures, even across markets, regions or globally.”); Yutaka Yamaguchi, Triangular View of Systemic Risk and Central Bank Responsibility 2, Mar. 7, 2002, Speech for the Third Conference on Risk Measurement and Systemic Risk, Bank for Int’l Settlements (discussing frameworks for analyses of
connectivity and may reflect various types of identified risk, including market risk, counterparty or credit risk, liquidity risk, and operational risk.\textsuperscript{12}

Federal regulation of financial markets in the U.S. has reflected a crisis-reaction paradigm that has been highly reactive in the face of adverse market events.\textsuperscript{13} In the securities regulation context, regulatory intervention has reflected a recognition shaped by both historical experience and empirical evidence that “[f]inancial markets do not prosper when left to market forces alone.”\textsuperscript{14} Twentieth century policy responses to financial crises in the U.S. have included both financial rescues and often hasty and at times not adequately considered regulation.\textsuperscript{15} Better risk management both from regulators and financial market firms could decrease the need for financial rescues. The credit crisis signals changes in financial markets. The nature of these changes necessitates fundamental reassessment of the role of financial market regulation, particularly with respect to systemic risk that arises from the connectivity of financial market participants, products, and trading strategies.

The locus of financial regulation remains largely top-down and focused on institutional entities in a financial market architecture where changing technologies and institutional structures have heightened the importance of understanding how financial networks are constituted from the bottom-up. Further, facilitated by the pervasive deployment of information and communications technology, financial markets are increasingly global both in terms of participants as well as in the webs that connect them.\textsuperscript{16} Global financial marketplace connectivity is coupled with ever increasing complexity on multiple levels. Complex financial instruments created by financial engineers or “Quants,” intricate trading strategies, and dense networks of relationships are particularly evident in the over-the-counter (OTC) derivatives arena.\textsuperscript{17} The complexity and likely behavior of derivatives may challenge even highly sophisticated market professionals and

\begin{footnotesize}
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\item[12] SATYAJIT DAS, TRADERS, GUNS & MONEY: KNOWN AND UNKNOWNS IN THE DAZZLING WORLD OF DERIVATIVES 158 (2006) (identifying types of financial risks and noting market risk reflects the risks an investor would experience when the price of a stock owned by the investor falls, credit risk is the risk that counterparties that owe an investor money cannot pay the investor back, liquidity risk is risk that an investor cannot sell the investor’s holdings, buy back what the investor is short and runs out of money to fund positions or make payments, and operational risk a catch all category that captures risk that is not market, credit or liquidity risk).
\item[13] See infra notes ___ to ___ and accompanying text.
\item[15] Five Years Under the Thumb, ECONOMIST, July 26, 2007 (describing the hasty passage of Sarbanes-Oxley, which was a reaction to corporate frauds such as Enron); HENRY N. BUTLER & LARRY E. RIBSTEIN, THE SARBNES-OXLEY DEBACLE: WHAT WE’VE LEARNED; HOW TO FIX IT (2006).
\item[16] ANNA NAGURNEY & STAVROS SIKOKOS, FINANCIAL NETWORKS: STATICS AND DYNAMICS 7 (1997) (noting that a theory of financial networks is relevant in light of the increasing globalization of financial decision-making and technological developments).
\item[17] See infra notes ___ to ___ and accompanying text.
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make outcomes of participation in financial markets more uncertain for many participants. Markets for subprime mortgage derivative securities, which were a hot point for the emergence of the credit crisis, have also reflected financial market trends towards complexity, globalization, and secrecy.

OTC derivatives have been essential tools in the creation of vast global financial networks. In June 2008, an estimated $683.7 trillion in notional value of OTC derivatives was outstanding. Notional amount reflects the principal value of the underlying assets on which the derivative is based, represents a measure of market size, and serves as a reference point for determining contractual payments. Notional amounts are not exchanged in most OTC derivatives contracts and thus do not represent a meaningful measure of derivatives’ risk. The gross market value of derivatives, which measures the cost of replacing all existing contracts, is a better measure of market risk. The gross market value of OTC derivatives in June 2008 was $20.4 trillion or close to one-third of global gross domestic product (GDP) and was also larger than the GDP of any single country.

Stock markets are places where, among other things, people trade. Financial markets represent a significant segment of U.S. economic activity, accounting for approximately 8 percent of U.S. GDP. Technology has enabled the development of virtually borderless financial markets in which financial market participants transact business throughout the world: “[b]y 2007 . . . three major U.S. investment banks derived nearly 50 percent of their net revenues from offshore activity,” while foreign securities holdings by U.S. investors almost doubled from $3.1 trillion to $6.0 trillion between 2003 and 2006. Global linkages facilitate rapid spread of contagion, and disturbances in markets in one country or region can contribute to market instability in other

20 Id. at 4.
22 BIS, supra note 19, at 2, 4 (noting that amounts at risk in derivatives transactions are a function of price level and/or volatility of the financial reference index used to determine payments, duration and liquidity of contracts, creditworthiness of counterparties, and whether exchange of notional principal is made between the counterparties).
23 Id. at 1.
26 BERNSTEIN, supra note 3, at 298 (describing a stock market as more than a place where traders buy and sell “bits and pieces of corporate ownership,” but also a “means for transforming fixed capital assets into a liquid form that can be converted into cash”).
28 Id. at 21.
areas of the world, which challenges financial market regulation based at the national level. The complexity and pace of innovation in global financial markets particularly tests regulators, whose prior training and experience may not adequately prepare them for the reality of complex and networked global financial markets.

Private equity funds, hedge funds, and OTC derivatives have been areas of significant innovation and growth. This growth in part reflects what some refer to as regulatory arbitrage. In addition to being lightly regulated, private equity, hedge funds and OTC derivatives may be characterized by significant amounts of secrecy, as well as impenetrability partially due to complexity. The rise of private equity and hedge funds has led to a significant class of “private” investors whose holdings are neither known nor transparent, but who have the potential to have a significant impact on capital markets. Secret investment strategies, dark pools of liquidity, and other undisclosed practices and holdings have profound implications for market risk by virtue of the limited knowledge that regulatory authorities and other market participants may have with regard to individual participants and in aggregate. This limited knowledge makes it more difficult for market participants to “interpret” markets, heightens uncertainty, and increases financial network risk. Secrecy thus challenges the disclosure emphasis of existing securities regulation frameworks as well as the ability of regulators and market participants to recognize and manage network risk.

This paper considers the network risk that may come with greater secrecy, globalization, and complexity in financial markets and among market actors and suggests ways that market participants can and should better internalize the risks they may create and regulators more effectively regulate such risk. Using the credit crisis as a starting point for discussion, Part I of this paper focuses on the implications of networks and trading activities for financial market regulation, discussing some ways in which U.S. regulatory architecture is a poor fit for financial

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29 See infra notes ___ to ___ and accompanying text.
30 Daniel Gros, Europe’s Two Priorities for the G20, in WHAT G20 LEADERS MUST DO TO STABILISE OUR ECONOMY AND FIX THE FINANCIAL SYSTEM 33, 34 (Barry Eichengreen & Richard Baldwin, eds. 2008) (noting that “an internationally integrated banking market is not compatible with exclusively national banking supervision”).
31 Nouriel Roubini, Ten Fundamental Issues in Reforming Financial Regulation and Supervision in a World of Financial Innovation and Globalization, at 3, RGEMonitor, Mar. 31, 2008, http://media.rgemonitor.com/papers/0/Nouriel-RegulationSupervisionMarch08.pdf (noting that lighter regulation and supervision of non-bank financial institutions has casued significant regulatory arbitrage evident in the transfer of “a large fraction of financial intermediation to non-bank financial institutions such as broker dealers, hedge funds, money market funds, SIVs, conduits, etc.”).
32 Government Accountability Office (GAO), Hedge Funds: Regulators and Market Participants Are Taking Steps to Strengthen Market Discipline, at 9, Jan. 2008 (noting that hedge funds are structured and operated to enable the fund and its managers to qualify for exemptions from registration and disclosure requirements and federal securities law provisions that apply to other investment pools).
33 Patrick M. Parkinson, The Role of Hedge Funds in the Capital Market, Testimony Before Subcommittee on Securities and Investment, Committee on Banking Housing and Urban Affairs, U.S. Senate, May 16, 2006, (noting that although available information about hedge funds is quite limited, “hedge funds clearly are increasingly consequential as providers of liquidity and absorbers of risk” in various capital markets).
34 Nicholas Chan et al., Systemic Risk and Hedge Funds, in THE RISKS OF FINANCIAL INSTITUTIONS 235, 236 (Mark Carey & René M. Stultz eds. 2006) (describing hedge funds as “[u]nregulated and opaque investment partnerships that engage in a variety of active investment strategies”).
market architecture. Part II focuses on trading activities in financial networks and considers how incomplete conceptions of the activities of traders shape existing regulation. Part III concentrates on secrecy and some ways in which market complexity may contribute to impenetrability and a generalized lack of knowledge about the activities of many players that may exacerbate information asymmetry and increase uncertainty about likely outcomes for market participants. Part IV discusses potential modifications to regulatory architecture that could create better incentives for market participants to internalize their risks, as well as ways that regulators can better assess and regulate network risk in financial markets. Part IV also discusses the benefits of adopting a “Twin Peaks” model of regulation by objective endorsed by the recent Treasury Department Blueprint for financial market regulation,35 the adoption of which should facilitate development of more effective regulatory frameworks with respect to systemic risk.

I. TRADING, NETWORKS, AND REGULATION

A. Networks and Financial Contagion: Trading, Credit Intermediation, and the Credit Crisis

1. The U.S. as Crisis Epicenter: Liar Loans and Subprime Derivative Securities

In 2008 financial markets are again in crisis. Significant portions of twentieth century regulatory frameworks in the U.S. were adopted in reaction to specific financial market crises.36 These regulatory frameworks no longer have sufficient flexibility to adapt to and anticipate financial market crises. The credit crisis was not averted despite the presence of extensive regulatory frameworks in the U.S. that are intended to regulate markets and enhance market stability. In the second half of 2008, credit markets became increasingly illiquid, with the U.S. emerging as an epicenter of a global financial contagion.37 Although differing accounts have and no doubt will continue to be offered concerning the origins of this global credit crisis, a comic featuring stick figures offers an instructive lesson about attitudes that preceded the credit crisis. The comic, entitled The Subprime Primer,38 humorously describes the excesses in mortgage origination and securitization that were evident in the housing market in the early 2000s. This comic includes characters who discuss the “Liar Loans” given by mortgage brokers that became mortgages that banks needed to remove from their balance sheets, the securitization of such low quality mortgages into complex OTC derivatives, and the faulty assumptions about risk that shaped the worldviews of buyers and sellers of such derivatives.

36 Id. at 2 (discussing regulatory responses to various events and crises); Under Secretary Steel Remarks on U.S. Financial Regulation, Dept. Treas. Press Release, Feb. 7, 2008 (noting that regulatory frameworks have been “largely knit together over the last 75 years – with act on top of act, initiative on top of initiative – each a reaction to various crises or innovations in the financial services industry”).
37 ROBERT J. SHILLER, THE SUBPRIME SOLUTION: HOW TODAY’S GLOBAL FINANCIAL CRISIS HAPPENED, AND WHAT TO DO ABOUT IT 101 (2008) (noting that the most serious consequences of the subprime crisis are systemic and will be felt throughout the entire economic system).
38 http://docs.google.com/TeamPresent?docid=ddp4zq7n_0cdjsr4fn&skipauth =true&pli=1.
In the real world at the end of the 1990s, investors seeking higher yields flooded the market for structured finance securities (SFSs), including subprime mortgage derivative securities.\textsuperscript{39} The first SFSs were created in the 1970s and by the early 2000s had become the largest component of global fixed-income markets.\textsuperscript{40} SFSs reflect a credit universe of pervasive credit derivatives where companies increasingly meet their financing needs through hybrid instruments and derivatives rather than “plain vanilla” equity and debt financings.\textsuperscript{41} SFSs also reflect a broader economy in which trading in securities markets plays an increasingly important role in credit intermediation.\textsuperscript{42} Markets for subprime mortgage derivative securities exemplify credit market transformations.

Subprime mortgages are mortgages given to home purchasers with higher credit risk.\textsuperscript{43} This higher credit risk can be due to multiple factors, including poor credit or unverifiable income.\textsuperscript{44} The market for subprime mortgages exploded in the late 1990s, and subprimes exceeded 15 percent of the total mortgage pie in some regions,\textsuperscript{45} growing from $173 billion in 2001 to an estimated $665 billion in 2005,\textsuperscript{46} some $507 billion of which ended up being repackaged into mortgage bonds.\textsuperscript{47} The expansion of the subprime loan market reflected significant financial innovation in the form of creative loan packaging for home purchasers that enabled a broad range of buyers, not just subprime loan recipients, to increase leverage by taking cash out in refinancing existing homes or putting little money down on new homes.\textsuperscript{48} Such loan packages...

\textsuperscript{39} Steve Rothwell, \textit{Around the Markets: CDO Surge Squeezes Bond Funds at Deutsche Bank and Vanguard}, INT’L HERALD TRIB., Feb. 7, 2007; Ratul Roy, \textit{Trading Credit Tranches: Taking Default Correlation out of the Black Box}, in \textit{THE STRUCTURED CREDIT HANDBOOK} 197, 198 (Arvind Rajan, Glen McDermott & Ratul Roy eds. 2007) (noting that tight corporate yields stimulated investor demand for tranched structured finance products); CRMPG III, \textit{supra} note 18, at 3 (noting that financial market liquidity and relatively low interest rates led to a “reach for yield” phenomenon that drove demand for highly complex structured credit products).

\textsuperscript{40} Ratul Roy & Glen McDermott, \textit{ABS CDOs}, in, \textit{THE STRUCTURED CREDIT HANDBOOK} 335, 335 (Arvind Rajan, Glen McDermott & Ratul Roy eds. 2007).


\textsuperscript{42} PRESIDENT’S WORKING GROUP ON FINANCIAL MARKETS, HEDGE FUNDS, LEVERAGE, AND THE LESSONS OF LONG-TERM CAPITAL MANAGEMENT 2 (April 1999).

\textsuperscript{43} Kristopher Gerardi, Adam Hale Shapiro & Paul S. Willen, \textit{Subprime Outcomes: Risky Mortgages, Homeownership Experiences, and Foreclosures} 6, Federal Reserve Bank of Boston, Working Paper 07-15 (noting that the universe of subprime loans evolved over time to include loans originated by subprime lenders made to marginal borrowers that were riskier relative to the average borrower on any number of different criteria, including zero down borrowers, no doc or low doc borrowers, purchasers buying more expensive homes than they could qualify for under prime mortgages or any combination of the above); Vikas Bajaj & Louise Story, \textit{U.S. Mortgage Crisis Spreads Past Subprime Loans}, INT’L HERALD TRIB., Feb. 12, 2008.

\textsuperscript{44} Gerardi, Shapiro & Willen, supra note 43, at 5 (“The term subprime borrower has traditionally been applied to a borrower that is perceived to be a higher lending risk relative to the average borrower, usually because of a poor credit history.”).

\textsuperscript{45} \textit{Id.} at 23 (noting that the percentage of state’s purchase mortgage originals made by subprime lenders reached between 10 and 15 percent in 2004-2006).


\textsuperscript{47} Michael Lewis, \textit{The End}, Portfolio.com, Nov. 11, 2008.

\textsuperscript{48} \textit{Id.} (describing the loan practices of Long Beach Financial, wholly owned by Washington Mutual, as “moving money out the door as fast as it could, few questions asked, in loans built to self-destruct”); David Leonhardt, \textit{Can’t Grasp Credit Crisis? Join the Club}, N.Y. TIMES, March 19, 2008.
included variable interest rate options and repayment schedules, as was the case with option Adjustable Rate Mortgages (ARMS) or Pick-a-Pay mortgages. Various government policies further encouraged consumer leveraging trends. The Bush administration initiated a program to encourage home ownership that permitted home purchases with no money down. Tax policies, including the deductibility of home mortgage interest payments and tax exemption for capital gains from home sales adopted in 1997 during the Clinton administration, further encouraged consumers to purchase homes. The Federal Reserve under Alan Greenspan maintained low interest rates that many assert led to a housing bubble.

During the housing bubble, lax credit practices led to less than vigorous documentation of loans, leading commentators to refer to certain types of deceitful loan transactions as involving “ninja” (no income no job or assets) mortgages or liar loans. The expansion of the subprime sector of the early 2000s coincided with changes in bank practices with respect to mortgage loan assets on their balance sheets. Rather than retaining mortgage loans they originated, many banks sold homebuyers’ mortgages to investment banks and others that would pool such mortgages and securitize them. Securitization reflected regulatory capital arbitrage by banks that took advantage of regulatory capital requirements that led to securitized assets having effectively lower capital risk weights.

49 Bajaj & Story, supra note 43 (discussing terms of option-rate mortgage made in 2006 by Countrywide Financial); Michael Moss & Geraldine Fabrikant, Once Trusted Mortgage Pioneers, Now Pariahs, N.Y. TIMES, Dec. 24, 2008, (describing the option ARM or Pick-a-Pay, now held by an estimated 2 million homeowners, that required payments of less than the amount of interest charges on the mortgage loan, leading in many cases to increasing mortgage principal balances over time).
50 Jo Becker, Sheryl Gay Stolberg & Stephen Labaton, White House Philosophy Stoked Mortgage Bonfire, N.Y. TIMES, Dec. 20, 2008 (“This administration made decisions that allowed the free market to operate as a barroom brawl instead of a prize fight,” said L. William Seidman, who advised Republican presidents and led the savings and loan bailout in the 1990s. “To make the market work well, you have to have a lot of rules.”).
52 Vikas Bajaj, They Cried Wolf, They Were Right, N.Y. TIMES, Sept. 23, 2007, (“The main discussion now, with the benefit of hindsight, is whether the central bank should have taken a more muscular approach in regulating mortgage lending and raised interest rates sooner.”); Edmund L. Andrews, Greenspan Concedes Error on Regulation, N.Y. TIMES, Oct. 23, 2008, (“Mr. Greenspan’s critics say that he encouraged the bubble in housing prices by keeping interest rates too low for too long and that he failed to rein in the explosive growth of risky and often fraudulent mortgage lending.”).
54 Gerardi, Shapiro & Willen, supra note 43, at 6 (noting existence of potentially different definitions of subprime in the secondary mortgage market that divided mortgage pools into prime, alt-A and subprime and that mortgages categorized as subprime in the secondary market are not necessarily loans made to borrowers with poor credit histories); Gary B. Gorton, The Subprime Panic, at 7, Oct. 2008, NBER Working Paper No. 14398, http://papers.nber.org/papers/w14398 (noting that securitization was the main finance mechanism for subprime originators).
2. Securitization, Derivatives, and Trading Culture: Transforming Assets into Tradable Securities

Securitization is a process by which individual assets are sold by their original owners, then pooled and transformed into derivative financial instruments with payment streams like a bond. The payment streams from the underlying assets collateralize the derivative securities issued as a result of a securitization. A broad range of underlying assets has been securitized, including credit card receivables, auto loans, franchise loans, mutual fund service fees, student loans, and equipment leases. Securitization has contributed to general financial markets trends towards greater trading by enabling transformation of assets that were not traded and that remained on individual companies’ balance sheets into financial instruments with in many cases liquid trading markets.

Securitization may involve creation of OTC derivatives such as mortgage-backed securities (MBS) and other SFSs or asset-backed securities (ABS). Collateralized debt obligations (CDOs) may involve a resecuritization process in which MBSs and other pools of bonds are collected and securitized again. Structured Investment Vehicles (SIVs) are similarly backed by pools of assets such as MBSs and CDOs and reflect resecuritization of such assets through SIV conduits that issue short- and medium-term paper (asset-backed commercial paper), in contrast to CDOs, which typically issue longer-term debt. A vast menu of structured products has been created. Synthetic CDOs are CDOs structured using Credit Default Swaps (CDS) rather than bonds, while CDOs-squared are CDOs in which the underlying portfolio includes tranches of significantly lower risk capital weights than a low-risk mortgage with a 40 percent down payment). Paul S. Calem & Michael Lacour-Little, Risk-Based Capital Requirements for Mortgage Loans, at 5, Nov. 2001, Working Paper, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=295633 (finding that bank regulatory capital requirements promote use of securitization and other financial innovations “that often enable institutions to reduce regulatory capital requirements with little or no corresponding reduction in overall economic risk”).

Gary B. Gorton & Nicholas S. Souleles, Special Purpose Vehicles and Securitization, March 2005, NBER Working Paper No. W11190; Roy & McDermott, supra note 40, at 335 (noting that securitization is based on a true sale of assets so that creditors of the seller or originator do not have claim on the assets, and the securitized assets would not be treated as part of the estate of the seller or originator in bankruptcy).

Frank J. Fabozzi, Michael G. Ferri & Steven V. Mann, Overview of the Types and Features of Fixed Income Securities, in THE HANDBOOK OF FIXED INCOME SECURITIES 3, 18-20 (Frank J. Fabozzi ed. 2001) (noting that asset backed securities are structured much like mortgage backed securities with issuers creating classes of bonds with different risk and return characteristics).

Roy & McDermott, supra note 40, at 336-37.

Id. at 338-41.

Anthony Thompson et al., Global CDO Market: Overview and Outlook, GLOBAL SECURITISATION AND STRUCTURED FINANCE 8, 8 (2007) (discussing CDO market innovations in 2006).

Richard J. Rosen, The Role of Securitization in Mortgage Lending, CHICAGO FED LETTER No. 244, Nov. 2007; Ingo Fender, Nikola Tarashev & Haibin Zhu, Credit Fundamentals, Ratings and Value-at-Risk: CDOs versus Corporate Exposures, BIS QTLY REV. 87, 88 (March 2008) (noting that 49% of the $560 million in CDOs issued in 2006 were structured finance CDOs).

Rosen, supra note 61.

other CDOs. The structure of CDOs-squared and other structured instruments involving multiple levels of derivatives amplifies their risk. Multiple layers of derivatives are more complex, making understanding of the price movements and volatility of such instruments potentially difficult. The high level of complexity of many structured finance products contributed to the collapse in liquidity for a broad range of such products in the credit crisis.

In addition to facilitating the creation of complex derivatives, financial engineering has also permitted transformation of pools of riskier subprime mortgages into AAA derivative financial instruments with the highest of credit ratings. In the case of ABS CDOs, pools of ABSs are used to create a waterfall structure that can include as many as 20 or more tranches. Each tranche can be sold as a different financial instrument with a different credit rating that reflected different risk and return characteristics. Investors in higher rated AAA tranches in CDOs with home mortgage assets are exposed to less risk and will experience an impact from mortgage defaults on underlying mortgage assets later than would holders of lower rated tranches. These financial instruments have been packaged in a variety of ways and sold to a wide range of investors. Investors relied to a significant extent on the ratings given such instruments by credit rating agencies, three of which were responsible for 96% of outstanding structured finance ratings. Rating agencies play a crucial verification function in fixed income markets. Many

Torquay that, as a result of defaults in the underlying corporate debt pool, has recognized a loss of A$7 million on its A$13.5 million investment and may be required to pay as much as A$12 million to honor its insurance commitments.

64 Nomura Fixed Income Research, CDOs-Squared Demystified I (Feb. 4, 2005); Ratul Roy & Matt King, Understanding CDO-Squareds, in The Structured Credit Handbook 229, 229 (Arvind Rajan, Glen McDermott & Ratul Roy eds. 2007) (noting that CDO’s resulted from “the market’s search for higher yields than synthetic CDOs can provide” and that the “squaring” process “transforms mezzanine CDO risk” by leveraging it and boosting potential returns to note holders).

65 Nomura Fixed Income Research, supra note 64, at 14 (noting that the double-layer structure of CDOs-squared amplifies the effects of varying risk factors).

66 CRMGP III, supra note 18, at 53; Carrick Mollenkamp & Serena Ng, Wall Street Wizardry Amplified Credit Crisis, WALL ST. J., Dec. 27, 2007 (discussing how CDOs “magnified and concentrated the effects of the subprime-mortgage bust” and led to billions of dollars of write-downs).

67 CRMGP III, supra note 18, at 53.


69 Creating CDO Tranches, CREDIT, Aug. 2004 (noting that the minimum number of tranches is usually three and describing a CDO that was divided into 28 tranches denominated in five currencies).

70 Roy & McDermott supra note 40, at 335; Jure Skarabot, Ratul Roy & Ji-Hoon Ryu, Single-Tranche CDOs, in The Structured Credit Handbook 149, 149 (Arvind Rajan, Glen McDermott & Ratul Roy eds. 2007) (noting that investors in single-tranche CDOs could choose their preferred credit portfolio, tranche, customized subordination level, and tranche size).


73 Gorton, supra note 54, at 27 (noting that investors purchased structured finance securities with incomplete knowledge about the structures of the securities, instead relying on repeat relationships with bankers and on ratings); John Patrick Hunt, Credit Rating Agencies and the “Worldwide Credit Crisis”: The Limits of Reputation, the Insufficiency of Reform, and a Proposal for Improvement, ____ COLUM. BUS. L. REV. ____ [5-6] (2008) (noting that Standard & Poor’s Moody’s and Fitch are the three major credit rating agencies in the U.S.).

structured finance instruments were actually far riskier than their ratings might suggest.\textsuperscript{75} Further, ratings agencies themselves had significant conflicts of interest that compromised the rating process.\textsuperscript{76} As a result, many attribute flaws in credit rating agency assessments of structured finance instruments as a principal underlying cause of the credit crisis.\textsuperscript{77}

3. CDOs and CDSs: Networks, Risk and Financial Contagion

CDOs that included exposure to home mortgage assets were priced and sold to investors based on particular assumptions about many variables, including how many homebuyers might default on their mortgages. Large numbers of institutional investors purchased CDOs and other ABSs based on mortgages and other types of assets. Many investment banks and institutions involved in the securitization process retained significant exposure to CDOs on their balance sheets.\textsuperscript{78} Fannie Mae and Freddie Mac, government sponsored enterprises (GSEs) chartered by the federal government to support residential mortgage secondary markets, are among the largest end users of derivatives and are closely linked to a small number of counterparties through OTC derivatives contracts.\textsuperscript{79} These GSEs, which have combined assets larger in value than the GDP of any country in the world save the U.S., Japan or Germany,\textsuperscript{80} pool mortgages and guarantee against credit risk as part of the securitization process.\textsuperscript{81} Freddie Mac and Fannie Mae also have large holdings of MBSs purchased in capital markets.\textsuperscript{82} Heavy losses at Fannie Mae and Freddie

\textsuperscript{75} Hunt, supra note 73, at [4] (noting that “many observers have argued that undeserved high credit ratings on novel financial products contributed materially to the turmoil”).

\textsuperscript{76} Partnoy, supra note 74, at 60 (noting that rating agency conflicts emanate from their direct payment by issuers, ability to give unsolicited ratings, and recent focus on structured finance and credit derivatives, which generate large amounts of revenue for them).

\textsuperscript{77} PRESIDENT’S WORKING GROUP, POLICY STATEMENT ON FINANCIAL MARKET DEVELOPMENTS 2 (March 2008) (“ Nonetheless, it seems clear from experience to date that the principal underlying causes of the turmoil in financial markets were . . . flaws in credit rating agencies’ assessments of subprime residential mortgage-backed securities (RMBS) and other complex structured credit products, especially collateralized debt obligations (CDOs) that held RMBS and other asset-backed securities (CDOs of ABS”); Gretchen Morgenson, Debt Watchdogs: Tamed or Caught Napping, N.Y. TIMES, Dec. 6, 2008 (noting belief by many that rating agencies “either underestimated the risk of mortgage debt or simply overlooked its danger so they could rake in large profits during the housing boom.”).

\textsuperscript{78} John Cassidy, Subprime Suspect, NEW YORKER, March 31, 2008, at 78 (discussing the role of subprime mortgages in the fall of Merrill Lynch CEO Stan O’Neal).

\textsuperscript{79} OFFICE OF FEDERAL HOUSING ENTERPRISE OVERSIGHT (OFHEO), SYSTEMIC RISK: FANNIE MAE, FREDDIE MAC AND THE ROLE OF OFHEO 5, 59-66 (Feb. 2003) (noting that the concentration of total derivatives activity with Freddie and Fannie counterparties is such that problems with the counterparties alone could lead to a systemic event and Fannie and Freddie “could find themselves unwilling participants in a problem only partially of their own doing.”).

\textsuperscript{80} Bethany McLean, Fannie Mae’s Last Stand, VANITY FAIR, Feb. 2009.

\textsuperscript{81} OFHEO, supra note 79, at 45 (noting that Freddie Mac and Fannie Mae buy mortgages from lenders, financing such purchases through the issuance of debt or the creation and sale of guaranteed securities backed by pools of loans, and guarantee MBS issued by lenders).

\textsuperscript{82} McLean, supra note 80 (noting that Fannie and Freddie have guaranteed $3.7 trillion in mortgage debt); OFHEO, supra note 79, at 5, 69-71 (discussing Fannie and Freddie business model and noting that “[i]ncreasingly, [Fannie Mae and Freddie Mac] hold mortgages not as whole loans, but in the form of their own guaranteed MBS, which they purchase in the capital markets.”); James R. Hagerty, U.S. Rethinks Roles of Fannie, Freddie, WALL ST. J., Dec. 1, 2008 (noting that even after seizure, Freddie and Fannie still buy or guarantee more than half of all U.S. home loans); Rosen, supra note 61 (noting that Fannie and Freddie accounted for 40% of MBSs issued in 2006, using conforming loans to back the MBSs they issued, adding guarantees of payment for principal and interest).
Mac and fears about potential network effects from their collapse led to their seizure by the U.S. government in September 2008.\textsuperscript{83}

Exposure to CDOs extends beyond those directly involved in MBS and CDO transactions. Monoline bond insurers and insurance companies such as American International Group, Inc. (“AIG”) retained significant exposure to CDOs by virtue of the Credit Default Swaps (CDS) they entered into in which they essentially insured payment streams for CDOs and other financial instruments.\textsuperscript{84} The CDS market exemplifies financial market network links among market participants through OTC derivatives contracts. CDS contracts are largely unregulated OTC derivatives contracts where a party (the protection seller) guarantees payment of a fixed-income security to another party (the protection buyer) in exchange for a typically quarterly or semiannual premium payment or fee paid from the buyer to the seller.\textsuperscript{85} In the early 2000s, insurers began guaranteeing payment for large numbers of CDO securities, expanding from their traditional bases in the safer world of municipal bonds.\textsuperscript{86} In 2008, it became increasingly clear that significant large sellers of CDS, including AIG, which had close to $600 billion in unhedged CDS exposure at the end of 2007,\textsuperscript{87} had not correctly calculated the risk of the guarantees that they issued, leading some to suggest that failures or downgrades of monoline bond insurers was imminent.\textsuperscript{88} Prior to the credit crisis, because ownership of the underlying financial instrument being insured was not required, CDS transactions became an easy and inexpensive way to speculate on companies’ health.\textsuperscript{89} Large numbers of CDSs have been issued, and CDS contract values rose from $180 million in 1997 to reach $57 trillion in notional value ($3 trillion in market value) in June 2008.\textsuperscript{90} Bond insurer troubles have led to network effects that have infected markets for student loans and municipal bonds.\textsuperscript{91} CDS contracts pose particular


\textsuperscript{84} James Surowiecki, \textit{Bonds Unbound}, \textit{NEW YORKER}, Feb. 11, 2008.

\textsuperscript{85} Arvind Rajan, \textit{A Primer on Credit Default Swaps, in THE STRUCTURED CREDIT HANDBOOK} 17, 17 (Arvind Rajan, Glen McDermott & Ratul Roy eds. 2007).

\textsuperscript{86} Surowiecki, \textit{supra} note 84.

\textsuperscript{87} Robert Lenzner, \textit{Why Wasn’t AIG Hedged}, \textit{FORBES}, Sept. 28, 2008 (noting that AIG held $562 billion in risky and unhedged CDS contracts on its books at the close of 2007).

\textsuperscript{88} Surowiecki, \textit{supra} note 84 (discussing implosion of the monolines); \textit{Bond Insurers are Facing Downgrades, N.Y. TIMES}, Sept. 18, 2008.

\textsuperscript{89} \textit{Giving Credit Where It is Due}, \textit{THE ECONOMIST}, Nov. 6, 2008 (“As with previous innovations, speculation on the health of companies soon swamped the need for insurance that was the market’s original purpose. CDS contracts were worth $62 trillion at the peak, far more than the bonds the CDSs were insuring.”).

\textsuperscript{90} Rajan, \textit{supra} note 85, at 18; BIS, \textit{supra} note 19, at 1.

\textsuperscript{91} Subcommittee on Capital Markets, House Committee on Financial Services, \textit{The State of the Bond Insurance Industry}, at 2, Feb. 14, 2008, Serial No. 110-91 ) (Remarks of Chairman Kanjorski) (noting that bond insurer downgrades have led to limited availability of bond insurance, which has caused significant problems in student loan financing and municipal bond arenas, leading to some municipalities paying interest rates of more than 10 percent on outstanding short-term debts) Sylvan G Feldstein, Frank J. Fabozzi & Patrick M. Kennedy, \textit{Municipal Bonds, in THE HANDBOOK OF FIXED INCOME SECURITIES} 197, 216-218 (Frank J. Fabozzi ed. 2001) (noting the importance of insurance in municipal bond context in reducing investor credit risk and expanding marketability of certain municipal bonds).
problems in financial markets in part because CDS markets are not transparent, which has created significant systemic risk.  

The contraction of the U.S. housing market in the mid-2000s had a negative impact on CDOs and ABSs that included mortgages. Falling housing prices led to defaults on mortgages, particularly in the subprime sector where defaults were markedly higher. By October 2008, an estimated 10 million homes in the U.S. had a mortgage balance higher than the value of the house. The falling value of underlying residential mortgage assets that were packaged into MBSs and CDOs has wreaked havoc on the payouts to investors in CDOs and other credit derivatives, in part because the housing price declines led to higher than anticipated mortgage default rates. Accounting rule changes that required financial institutions to mark the values of such assets to market in their financial statements also played a role and contributed to financial statement volatility. The values of CDOs with mortgage exposure plummeted and the market for many structured derivative securities became illiquid, making it difficult for holders to either sell or even value the financial instruments that they held. The presence of such “toxic” assets soon threatened the capitalization and liquidity of a broad range of financial institutions around the world. Falling values of CDOs triggered payment obligations by CDS protection sellers, which contributed to the fall of AIG.

Risk models on which CDOs and other structured securities were based did not appropriately factor in the likely consequences of declining housing values or a liquidity crunch that would make even secured financing backed by high-quality collateral unavailable. Gaps in risk

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92 John J. Schneider & Daniel S. Bender, The Impact of Regulation on Credit Default Swaps, at 2, 2008, Navigant Consulting (noting that the inability of regulators and the financial system to monitor CDS exposure has contributed to the systemic impact of the CDS market).
93 Gerardi, Shapiro & Willen, supra note 44, at 1 (noting important role of depreciating house prices in generating foreclosures).
94 Id. at 1 (finding that homeownerships that begin with a subprime purchase mortgage end up in foreclosure more than six times as often as homeownership experiences that begin with prime purchase mortgages); John Leland, Baltimore Finds the Subprime Crisis Snags Women, N.Y. TIMES, Jan. 15, 2008 (noting that subprime loans make up 13 percent of existing home loans but 55 percent of foreclosures).
97 See infra notes to and accompanying text.
98 Cracks in the Façade, ECONOMIST, March 22, 2007 (“Spreads have dramatically widened on the securities backed by riskier mortgages and the pooled and debt-laden collateralised-debt obligations (CDOs) based on them.”).
100 Maurna Desmond, AIG. CDOs. CDS. It’s a Mess, FORBES, Nov. 15, 2008 (noting that when CDOs fail to pay, insurers who sold CDS must either make a payment or buy the bond, depending on the CDS transaction terms).
101 Lewis, supra note 47 (describing conversation between Steve Eisman, a hedge fund investor, and a representative of Standard & Poor’s in which the S&P representative disclosed that its models for home prices did not have the ability to accept a negative number to reflect declining home prices); Confessions of a Risk Manager, Aug. 7, 2008, THE ECONOMIST (“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.”) [hereinafter, “Confessions”]; SEC, Office of Inspector General, SEC’s Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program 7, Sept. 25,
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models and management reflected an incomplete understanding of financial networks and the full implications of trading of credit derivatives and other complex structured products. Problems soon spread to other financial markets, including markets for Auction Rate Securities, a $330 billion market that failed in February 2008. An increasing loss of confidence soon followed, leading to a downward spiral in which financial institutions refused to lend to one another. Financial institutions such as Bear Stearns, Wachovia, and Lehman Brothers either collapsed or were sold. The credit crisis contagion continued spread, with the commercial paper market experiencing a significant contraction in October 2008.

The Counterparty Risk Management Policy Group III (CRMPG III) is a group of industry participants given the task of providing a private sector response to the credit crisis. CRMPG III has identified four forces that are often common denominators to financial contagion: credit concentration, maturity mismatches, excessive leverage on balance sheets or embedded in individual classes of financial instruments, and the illusion of market liquidity. These factors all played a role in the credit crisis and contributed to the spread of contagion through the same networks that connected market participants during more favorable market conditions. The credit crisis thus reflects important perils of networked financial markets.

Pervasive networks mean that varied players are highly dependent on others for a wide range of their own activities, including day-to-day financing in some instances. For example, repurchase (repo) agreements form an important foundation for fixed income and OTC derivatives transactions. Repo markets have tripled in size since 2002, with global volume at the end of 2007 of some $21 trillion in the U.S., Euro, and UK repo markets. Repo transactions are

2008, Report No. 446-A [hereinafter, “SEC Inspector General Report A’] (“The Commission stated that neither the CSE program nor any regulatory model (i.e., the Basel Standards) used by commercial or investment banks considered the possibility that secured financing, even when backed by high-quality collateral could become completely unavailable.”).
102 Confessions, supra note 101; Wilson Sy, Credit Risk Models: Why They Failed in the Credit Crisis, at 3, July 2008, Australian Prudential Regulatory Authority Working Paper (noting that the credit crisis has exposed shortcomings of credit risk models).
103 CRMPG III, supra note 18, 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).
104 See infra notes ___ to ___ and accompanying text.
106 Feldstein, supra note 95 (“Credit will not flow and liquidity will not return to the banking system until financial institutions have confidence in the solvency and liquidity of other banks.”).
108 CRMPG III, supra note 18, at 6, 12.
109 Gorton, supra note 54, at 20-27 (describing an interlinked chain of securities, structures, and derivatives that was sensitive to house price movements).
110 MOORAD CHOUHDHY, AN INTRODUCTION TO REPO MARKETS 2-4 (2006); Peter Hördahl & Michael R. King, Developments In Repo Markets During The Financial Turmoil, BIS QUARTERLY REV. 37, 45-46 (Dec. 2008) (noting the higher volatility in U.S. versus European repo markets due to the dominance of investment banks in U.S. markets, whose business models used extensive leverage that was financed in repo markets and noting that the U.S. also had active markets for structured finance repos and lower quality collateral).
111 Hördahl & King, supra note 110, at 38.
112 Id. (noting repo market volume of $10 trillion in each of the U.S. and Euro markets and $1 trillion in the UK).
The credit crisis has led to significant negative effects not because networks exist but rather due to the failure of a broad range of market participants to take sufficient account of the risks of their activities. This widespread inattention to and even gorging on risk was not sufficiently tempered by extensive financial market regulatory frameworks. Mortgage originators and banks granting mortgages did not retain the risks of the loans they originated, giving them significant incentives to ignore the risks of these loans. The ability of banks to securitize their mortgage assets thus led to deteriorating underwriting standards and higher default risk. Because home mortgages in the U.S. are typically no-recourse, a wide range homeowners, not just buyers falling within the subprime category, also engaged in risky behavior and had insufficient

113 Frank J. Fabozzi & Steven V. Mann, Private Money Market Instruments, in The Handbook of Fixed Income Securities 231, 243 (Frank J. Fabozzi ed. 2001) (describing repo transactions); Christian Ewerhart & Jens Tapking, Repo Markets, Counterparty Risk, and the 2007/2008 Liquidity Crisis, at 1, 2008, Swiss Finance Institute Research Paper Series No. 08–24, (noting that in a typical repo “the lender of cash is compensated by an interest that is calculated from the nominal value of the transaction, the term, and the so-called repo rate”) (citations omitted).
114 Ewerhart & Tapking, supra note 113, at 2 fn. 1 (noting greater reliance in U.S. on overnight repo financing).
115 Hördahl & King, supra note 111, at 37-38.
116 Id. at 38, 42-49 (discussing conditions in repo markets during the credit crisis).
117 CRMPG, supra note 18, at 12 (“Contagion or the channels and linkages through which local financial disturbances can take on systemic characteristic are by their nature largely unpredictable. However, the basic forces that give rise to contagion are reasonably well known and recognized.”).
119 James Surowiecki, The Trust Crunch, NEW YORKER, Oct. 20, 2008 (“A few years ago, banks and other lenders seemed indifferent to risk, as they doled out loans to people with dubious incomes and poor credit records.”).
120 Andreas A. Jobst, Unsecured Securitization: Emerging Market CDOs After the US Sub-Prime Mortgage Crisis, GLOBAL SECURITISATION AND STRUCTURED FINANCE 8, 9 (2008).
incentive to avoid even highly risky mortgage loans that they might not be able to pay. From a borrower’s perspective, if home values increased, the home could be resold if the borrower could not repay the mortgage; in the worst case scenario, the borrower could walk away from his or her debts. Some borrowers were pushed into risky mortgages, while some were exploited by mortgage brokers who had greater interest in getting paid for new subprime customers than in considering the long-term implications of subprime loan terms for loan recipients. Others were, however, lured by the seeming prospect of risk-free profits.

The attitudes toward risk evident in relaxed credit standards at the mortgage level were also reflected in the activities of a broad range of participants in financial markets in the early 2000s. As a result, ratings agencies, bond insurers, investment banks, traders, and investors became less risk averse and did not properly reprice risk as market conditions changed. Varied market participants placed greater reliance on the ability of the network itself to absorb financial shocks, leading to greater moral hazard as well as greater system vulnerability to credit shocks. At the same time, the network itself became increasingly impenetrable and difficult to read, making such reliance even riskier. Similarly, regulators failed to apprehend the implications of pervasive networks and did not appropriately monitor risks of both regulated entities as well as unregulated entities linked to regulated ones.


1. Pervasive Financial Networks and the Power of Traders

As is the case in other areas of economic activity, financial systems are permeated with multiple levels of interrelationships. Through their influence on financial variables such as interest rates and currency prices, financial market networks reach deep into homes and pocketbooks of a significant portion of world’s population. The fallout from the subprime

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122 Martin Feldstein, How to Help People Whose Home Values are Underwater, WALL ST. J., Nov. 18, 2008 (noting that the U.S. is virtually unique in having no-recourse home mortgages, which is unlike Europe where falling housing prices do not trigger defaults).
123 Id.
124 Mark Whitehouse, Subprime Aftermath: Losing the Family Home, WALL ST. J., May 31, 2007 (discussing the aftermath of the subprime mortgage boom in Detroit neighborhoods where significant numbers of people may lose homes they owned before taking out subprime mortgages); Leland, supra note 94 (noting that subprime mortgages have gone disproportionately to women).
125 Bajaj & Story, supra note 43 (“Others disregarded warnings about complex loans because they wanted to be a part of the housing boom, which like the technology stock bubble lured people in with seemingly instant and risk-free profits.”).
126 Jobst, supra note 121, at 9; CRMPG III, supra note 39, at 3 (discussing causes underlying the credit market crisis and noting that credit risk “had been mispriced for some time”).
127 Id., supra note 121, at 9.
mortgage market collapse illustrates fundamental ways in which financial market participants and the broader global community are linked. These links can be conceptualized as networks that encompass myriad financial transactions that involve investment decisions and trading within a wide variety of settings.

The rich web of interconnections that link market players means that the individual value of most firms depends on payoffs received from claims on other firms. Further, the value of such claims depends on the financial health of other players. Although the significance of such linkages is often emphasized in times of market crisis, the ongoing importance of such interconnections is not sufficiently considered in the context of day-to-day regulation of financial markets. Of particular importance are the activities of traders, an increasingly powerful group within financial firms whose profit-making capabilities have led to their becoming more risk tolerant.

The traditional image of traders is often associated with physical markets, exemplified by pit traders at the Chicago Mercantile Exchange or floor traders at the New York Stock Exchange. Technology, however, has facilitated electronic trading, which has revolutionized finance and which is replacing physical trading. Large numbers of traders work with computers, Bloomberg and other terminals, and technologies that link traders and financial institutions to other financial market participants. The activities undertaken by varied individual participants in global financial markets play a significant role in determining network risk. Better understanding of network risk and the role of traders in creating and managing network risk could enable better management of potential risks to financial markets.

2. The Collapse of LTCM: Hedge Fund Active Trading as A Harbinger of the Credit Crisis

The activities of Long-Term Capital Management (LTCM), which was once regarded as the Rolls-Royce of hedge funds, reflect the power and importance of traders in financial markets. LTCM opened for business in February 1994 after raising $1.25 billion from a broad

131 Eisenberg & Noe, supra note 129, at 1.
132 Id.
133 Adam Tickell, Dangerous Derivatives: Controlling and Creating Risks in International Money, 31 GEOFORUM 87, 96 (2000).
134 Terrence Hendershott, Electronic Trading in Financial Markets, IT PRO 10, 10 (July/Aug. 2003) (noting that technological innovations have enabled electronic trading in financial markets, which has eliminated the need for face-to-face and telephone trading).
135 Niko Koppel, In Chicago, Rowdy Trading Scene Grows Quieter, N.Y. TIMES, Oct. 29, 2007 (noting that the Chicago Mercantile Exchange (CME) pork belly open outcry pit will be closed and operated by computer only as a result of the CME merger with the Chicago Board of Trade); Patrick McGeehan, New York Stock Exchange Floor Keeps Shrinking, INT’L HERALD TRIB., Sept. 23, 2007 (describing the trading floor as mainly a sideshow and noting that computerized trading is cheaper and is replacing face-to-face trading on the New York Stock Exchange).
136 Hendershott, supra note 134, at 10-14.
137 CHANCELLOR, supra note 1, at 339.
138 PWG, supra note 42, at 10, fn 12 (noting that LTCM formed a number of feeder funds structured to meet tax, regulatory, and accounting concerns of different classes of investors from different countries).
range of investors. LTCM, whose principals included prominent traders and two Nobel Prize winners, had a dozen or so trading strategies, including strategies involving convergence trades and dynamic hedging. LTCM’s treasury arbitrage trade was one of its simpler trading strategies. One example of this trade took advantage of market discounting of thirty-year U.S. Treasury bonds, which had led to an unexpectedly wide spread in yields. In 1994, betting that this spread would narrow, LTCM bought $1 billion of cheaper Treasury bonds and sold short $1 billion of more expensive Treasury bonds. LTCM paid for the cheaper bonds with money borrowed from several Wall Street banks and borrowed the more expensive bonds that it sold short. LTCM also loaned out the bonds that it had bought to other Wall Street firms, who wired cash to LTCM as collateral for the loaned bonds. This series of transactions enabled LTCM to make the $2 billion Treasury arbitrage trades without using any of its own cash, although maintaining the trade would cost LTCM a few basis points a month if rates moved as contemplated by LTCM, but potentially far more if rates moved in an unanticipated manner. LTCM’s trades involved complex strategies and trades that numbered in the thousands. At one point, LTCM was reported to have over 60,000 trades on its books. LTCM’s reputation enabled it to get credit on easy terms and facilitated its developing connections to other traders and financial institutions, many of whom were eager to make trades with LTCM.

In 1997, LTCM returned $2.7 billion in capital to its investors, which reduced its capital base by...
some 36 percent to $4.8 billion. Latin American Capital Management (LTCM) did not reduce the scale of its investment positions following the payment to investors, thus effectively increasing its leverage. LTCM’s leveraged trading strategy reflected extensive use of borrowing to purchase assets far in excess of its $4.8 billion in capital. What is typically referred to as equity, or in some instances capital, reflects the residual interest of owners of a firm (e.g., shareholders or partners) as a result of previous investor infusions into a firm as well as accumulated earnings from operation that are retained and not paid out to equity owners through dividends or a return of capital. Capital provides a cushion against risk that gives comfort to investors, intermediaries, creditors, and others doing business with a firm. By borrowing on top of its capital, LTCM was able to increase its return on its investments, which facilitated its high investment returns in its first two years of operation. However, a leveraged capital structure increases the risk for a firm’s equity owners, creditors, and intermediaries, and subjects the leveraged firm to greater risk. Seeking to continue earning high returns, LTCM did not decrease its leverage, which would have involved LTCM getting additional capital infusions from investors or reducing the scale of its investment positions. Instead, LTCM made riskier bets, including directional bets and equity trades, with even greater leverage. LTCM’s trading strategies and limited capital did not withstand market volatility in 1997 and 1998. Equity markets were volatile and credit spreads had their worst month then recorded in August 1998. In August 1998, LTCM had gross notional positions in excess of $1 trillion. By August 1998, LTCM’s balance sheet included more than $125 billion in assets, with a leverage ratio of more than 25-to-1. This level of leverage made LTCM increasingly vulnerable to adverse financial market conditions because any losses it incurred would reduce its already thin capital. By September 1998, continuing losses in the LTCM investment portfolio

151 PWG, supra note 42, at 11.
152 Id.
153 BARRY J. EPSTEIN, RALPH NACH & STEVEN M. BRAGG, WILEY GAAP: INTERPRETATION AND APPLICATION OF GENERALLY ACCEPTED ACCOUNTING PRINCIPLES 2009, at 1002 (2008) (noting that stockholders’ equity is the residual interest in the assets of an entity after deducting liabilities and is comprised of capital contributed to an entity plus accumulated earnings less any distributions made).
154 Banks Need More Capital, Economist, Dec. 18, 2008 (“For decades, holders of the liabilities of banks in the United States had felt secure with the protection of a modest equity-capital cushion, allowing banks to lend freely... How much extra capital, both private and sovereign, will investors require of banks and other intermediaries to conclude that they are not at significant risk in holding financial institutions’ deposits or debt, a precondition to solving the crisis.”).
155 BREALEY, MYERS & ALLEN, supra note 144, at 481-83 (noting that increased debt amplifies the spread of percentage returns and that leverage increases both expected returns and risk).
156 Id.
157 LOWENSTEIN, supra note 139, at 127-28; DAS, supra note 12, at 172 (noting that LTCM broadened its trading activities to include credit spread trading, volatility trading, and equity risk arbitrage).
158 LOWENSTEIN, supra note 139, at 134-150 (noting market impact of Asian currency crisis and Russian debt moratorium and devaluation).
159 Id. at 159.
160 PWG, supra note 42, at 11-12.
161 Id.
162 Id. (using the equity capital figure from January 1998 of $4.8 billion).
led to further reduction in LTCM’s equity, leading to leverage of greater than 100-to-1.163 Market conditions had an adverse impact on LTCM’s liquidity, as financing banks and LTCM counterparties sought additional collateral or to characterize LTCM’s performance as an event of default, which would trigger their right to demand repayment.164 On September 23, fear about the potential market impact of an LTCM collapse led the Federal Reserve Bank of New York to coordinate a private bailout and recapitalization of LTCM in which fourteen banks contributed close to $4 billion in exchange for 90 percent of LTCM equity.165

Risks arising from network connectivity help explain why LTCM was thought to present such a large threat to the overall financial system. In contrast, Amaranth, a hedge fund that suffered losses as large as LTCM in 2006, was not rescued.166 The collapse of LTCM might have led to an estimated $14 trillion in losses and likely disrupted global capital markets.167 The LTCM rescue was thus believed to be necessary because of the financial networks within which LTCM was embedded: “[t]he fund had entered into thousands of derivative contracts, which had endlessly intertwined it with every bank on Wall Street.”168 Bankruptcy Code exemptions for derivatives contracts from the automatic stay that protects bankrupt entities and their property from their creditors also contributed to the seeming need for a LTCM rescue.169

The credit crisis represents a replay on a bigger scale of previous failures, most particularly the collapse of LTCM.170 Events in the credit crisis reflect the type of network failures that many feared might happen with LTCM. The credit crisis has also led to instability and even failures at a wide range of global financial institutions, including AIG, Bear Stearns, Lehman Brothers, Britain’s Northern Rock Bank and Bradford & Bingley, and German, Danish, Belgian and Dutch financial services firms.171 The credit crisis liquidity crunch caused significant troubles at banks

163 LOWENSTEIN, supra note 139, at 191.
164 Id. at 155; PWG, supra note 42, at 13 (“LTCM’s repo and OTC derivatives counterparties were seeking as much collateral as possible through the daily margining process, in many cases by seeking to apply possible liquidation values to mark-to-market valuations.”).
165 LOWENSTEIN, supra note 139, at 207-208 (noting that new equity of $3.6 billion was contributed in exchange or 90 percent equity in LTCM); Joseph G. Haubrich, Some Lessons on the Rescue of Long-Term Capital Management, April 2007, Federal Reserve Bank of Cleveland, Policy Discussion Paper No. 19.
166 Steven Mufson, Hedge Fund’s Collapse Met with a Shrug, WASH. POST, Sept. 20, 2006, at D01; Ann Davis, Henny Sender & Gregory Zuckerman, What Went Wrong at Amaranth, WALL ST. J., Sept. 20, 2006 (noting that Amaranth confused paper trading gains with cash profits and was far more leveraged than it had realized).
167 CHANCELLOR, supra note 1, at 341.
168 LOWENSTEIN, supra note 139, at xix.
170 Roger Lowenstein, Long-Term Capital: It’s a Short-Term Memory, N.Y. TIMES, Sept. 7, 2008 (“Instead of learning from the past, Wall Street has re-enacted it in larger form, in the mortgage debacle cum credit crisis.”).
in Iceland, which having engaged in high levels of risk-taking and incurred significant leverage,\(^{172}\) were unable to get funds from the government of Iceland or other financial institutions.\(^{173}\) This led to the failure of the top three banks in Iceland and profound consequences for Iceland’s economy.\(^{174}\)

Consequently, as was the case in the late 1990s, we have again seen how crisis in one market or region can quickly precipitate global financial instability.\(^{175}\) In the late 1990s, a currency crisis in Asia contributed to a Russian devaluation and default on certain borrowings and ultimately the collapse of LTCM.\(^{176}\) LTCM was a private investment partnership that, as is typical with most hedge funds, operated in lightly regulated space.\(^{177}\) Although typically not subject to significant regulatory registration and disclosure requirements of the sort required of “public” companies, the activities of hedge funds and other private investment funds may have a significant impact on public markets in part through the operation of financial networks.

3. OTC Derivatives, Network Connectivity, and Leverage

OTC derivatives are key constitutive elements in financial market networks and have “enabled to a far greater degree of linkage across markets than at any other time.”\(^{178}\) Derivatives are financial instruments whose value is derived from the value of a separate underlying financial instrument (e.g., common stock in the case of a stock option).\(^{179}\) Derivatives may also reflect underlying variables such as fluctuations in interest rates, currencies or energy prices, or even predictions about natural phenomena like the weather.\(^{180}\) Derivatives come in different varieties,
including options, warrants, swaps, futures, and forward contracts, and may be traded on organized derivative exchanges (ODEs), such as the Chicago Mercantile Exchange, or on over-the-counter (OTC) markets.\footnote{HULL, supra note 179, at 1.} OTC markets include “traditional” dealer, electronically brokered, and proprietary trading markets.\footnote{Randall Dodd, \textit{The Structure of OTC Derivatives Markets}, 9 \textit{THE FINANCIER} 1-2 (2002).} 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 bought and sold in ODE markets.\footnote{CHICAGO MERCANTILE EXCHANGE, \textit{EXCHANGE TRADED DERIVATIVES IN A PROFESSIONALLY MANAGED PORTFOLIO} (noting that the “advantage of exchange-traded derivatives is that regulated exchanges provide clearing and regulatory safeguards to investors.”).} Although the competition posed by OTC markets for ODE markets has been noted, OTC and ODE in fact complement one another.\footnote{Jens Nystedt, \textit{Derivative Market Competition: OTC Markets Versus Organized Derivatives Exchanges}, at 7, April 2004, IMF Working Paper WP/04/61 (noting that large broker-dealers of OTC derivatives “frequently rely on a liquid ODE market to dynamically hedge their market risk”).} Because ODE markets are centrally cleared through clearinghouses, transactions in such markets are generally less risky.\footnote{Herbert L. Bayer, Virginia G. France & James T. Moser, \textit{Opportunity Cost and Prudentiality: An Analysis of Futures Clearinghouse Behavior}, at 1-2, Aug. 1994, World Bank Policy Research Working Paper 1340 (noting that future clearinghouses reduce risk of default by netting all of a trader’s trades with other clearinghouse members and enabling members to economize on margin and also noting that margin is the main risk management tool used by futures exchanges); BIS, \textit{Clearing Arrangements for Exchange-Traded Derivatives}, at 2, May 1997, http://www.bis.org/publ/cps23a.pdf (noting that the clearinghouse is the central counterparty to its clearing members and describing a number of safeguards that are used by clearinghouses to reduce the likelihood of default, including membership requirements, margin requirements to collateralize credit exposure, procedures for promptly resolving a clearing member’s default through closing out the member’s positions, and supplemental clearinghouse resources such as capital, asset pools, credit lines, guarantees, and assessment of non-defaulting members).} In contrast, clearinghouses have not traditionally been used in the OTC derivatives arena,\footnote{Henry T.C. Hu, \textit{Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism}, 102 YALE L.J. 1457, 1465 (1993) (noting that because OTC derivatives markets do not have clearinghouse arrangements, end-users must have confidence that the derivatives dealer is “creditworthy and will honor its contractual commitments”).} although clearinghouses may soon be implemented for Credit Default Swaps.\footnote{See infra notes ___ to ___ and accompanying text.}

OTC derivatives markets have experienced phenomenal growth in recent years, in part due to regulatory arbitrage as market participants converge on the least regulated market arenas.\footnote{Frank Partnoy, \textit{ISDA, NASD, CFMA, and SDNY: The Four Horsemen of Derivatives Regulation}, BROOKINGS-WHARTON PAPERS ON FIN. SERV. 213, 213 (2002).} OTC derivatives reflect a fundamental shift in the structure of the financial services industry.\footnote{Hunter & Marshall, supra note 10, at 304 (describing OTC derivatives as “one of the most profound structural developments in U.S. financial markets since the 1920s”).} Derivatives are used in many ways, including for hedging, speculation and arbitrage.\footnote{HULL, supra note 179, at 15.} Derivatives’ flexibility is beneficial to financial institutions because it permits fine-tuning of financial risks, which has generally improved financial market efficiency and liquidity, depth and...
breadth, and increased financial system capacity to bear risk and allocate capital.\textsuperscript{191} As connectivity between CDOs, CDS, SIVs, and structured products to investors and financial institutions around the world in the credit crisis illustrates, derivatives have enabled widespread linkages between firms and financial products. The versatility of derivatives, however, underscores their potential risks.\textsuperscript{192} Derivatives have thus also exacerbated vulnerabilities and turbulence in financial markets.\textsuperscript{193}

Derivatives are an important part of proprietary and client trading operations at 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.”\textsuperscript{194} As was illustrated by LTCM, the extensive leverage used in derivatives trading greatly magnifies risks.\textsuperscript{195} In the credit crisis, leverage has been 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.\textsuperscript{196} At the end of 2007, Morgan Stanley and Lehman Brother had leverage (assets to shareholders’ equity) of 33-to-1, while Merrill Lynch had leverage of 28-to-1.\textsuperscript{197} Although transformation of remaining Wall Street investment banks into commercial banks may influence their business models in the future,\textsuperscript{198} in 2008, a broad range of both commercial and investment banks had significant leverage, including Barclays Bank (61-to-1), Deutsche Bank (53-to-1), UBS (47-to-1), Fortis (33-to-1), Lehman Brothers (31-to-1), Goldman Sachs (26-to-1) and Bank of America (11-to-1).\textsuperscript{199} Leverage elevates profits during good financial market conditions but can be a critical element in failure during lean times.\textsuperscript{200}

\begin{thebibliography}{99}
\bibitem{192} HULL, supra note 179, at 15.
\bibitem{193} Schinasi et al., \textit{supra} note 191, at i, 3 (noting financial turbulence following collapse of LTCM and that “stochastic processes that govern the cash flows associated with OTC derivatives are inherently more difficult to understand, and seem to be more unstable during periods of extreme volatility in underlying asset prices.”)
\bibitem{195} LOWENSTEIN, \textit{supra} note 139, at 121-22 (discussing derivatives and leverage); DAS, \textit{supra} note 12, at 31-32 (noting the inherent leverage in derivatives as compared with investing in the underlying asset and stating that “[d]erivatives give you more leverage than anything else”).
\bibitem{197} Shawn Tully, \textit{End of Wall Street as We Know It}, FORTUNE, March 17, 2008.
\bibitem{198} Andrew Ross Sorkin & Vikas Bajaj, \textit{Shift for Goldman and Morgan Marks the End of an Era}, N.Y. TIMES, Sept. 21, 2008 (noting that investment banks became bank holding companies and acknowledged that their finance and investing model was too risky and needed the “cushion of bank deposits that had kept big commercial banks like Bank of America and JPMorgan Chase relatively safe amid the recent turmoil”); Jon Hilsenrath, Damian Paletta & Aaron Lucchetti, \textit{Goldman, Morgan Scrap Wall Street Model, Become Banks in Bid to Ride Out Crisis}, WALL ST. J., Sept. 22, 2008 (“Wall Street’s two most prestigious institutions will come under the close supervision of national bank regulators, subjecting them to new capital requirements, additional oversight, and far less profitability than they have historically enjoyed.”).
\bibitem{200} Leonhardt, \textit{supra} note 49 (“Investors then goosed their returns through leverage, the oldest strategy around. They made $100 million bets with only $1 million of their own money and $99 million in debt. If the value of the

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Discussion of derivatives often emphasize their role as a transformative and innovative force. However, as Max Weber long ago recognized, derivatives may also have significant negative consequences, particularly to the extent they may be used by traders “who lack both judgment

investment rose to just $101 million, the investors would double their money. Home buyers did the same thing, by putting little money down on new houses”).

Regulators with unclear and sometimes overlapping boundaries. In contrast to discussions about derivatives that focus on financial market innovation, the implications of derivatives for institutional and regulatory structures are generally less well considered. Regulators have difficulty keeping up with evolving financial innovations and investment strategies, and regulatory structures may reflect assumptions about financial market institutional structures that may no longer be valid.

C. Institutional Structures, System Dynamics, and Regulatory Architecture

Regulatory architecture is often shaped by institutional structures of the regulated industry. Financial markets and networks are increasingly global and complex. Although financial market institutional structures have attempted to respond to the challenges of global financial markets, including through exchange consolidation, demutualization and tapping public markets, U.S. regulatory architecture has lagged and remained complex and fragmented in the face of industry consolidation, conglomeration, and convergence. Regulatory fragmentation makes collaboration among various regulators difficult. Further, new regulatory structures have been put in place on top of existing ones with insufficient attention to the larger regulatory fabric being knit. In the futures and securities arena, multiple regulatory authorities are responsible for regulating different aspects of financial market networks. At the federal level, jurisdiction over securities and futures is split between the Securities and Exchange Commission (SEC) and the Commodity Future Trading Commission (CFTC), which was formed by Congress in 1974 to

209 Max Weber, The Stock Exchange, in MAX WEBER: SELECTIONS IN TRANSLATION 374, 374-75 (W.G. Runciman ed. 1978) (noting the potential positive consequences of futures trading, including moderation of price fluctuations and discussing potential deleterious activities of futures traders, including relating to manipulative trading and blind speculative buying).

210 Id. at 376 (outlining recommended institutional and regulatory structures that should govern futures trading).

211 Schinasi et al., supra note 191 (discussing OTC derivatives and modern banking).

212 JONATHAN LURIE, THE CHICAGO BOARD OF TRADE 1859-1905: THE DYNAMICS OF SELF-REGULATION 5 (1979); LiPUMA & LEE, supra note 130, at 7 (noting growing realization that markets “rely on governance and cultural institutions that they are also partly responsible for creating”).


215 GAO, supra note 214, at 17 (“While the regulatory agencies have taken action to work collaboratively in response to the industry’s trends . . . it is difficult to collaborate within the fragmented U.S. regulatory system . . . the structure of the federal regulatory system should be reexamined.”); G30, supra note 27, at 210 (noting that “complex array of supervisory agencies [in the U.S.] requires a high degree of coordination”).

216 Steel, supra note 36 (“Today we have a series of individual regulations, each designed in response to specific circumstances and lacking an overarching set of guiding principles. Our system has multiple federal and state regulators with unclear and sometimes overlapping boundaries.”).
promote the development of commodities and futures markets. The SEC has jurisdiction over securities (including derivatives such as stock options). The CFTC has exclusive jurisdiction over futures, which, unless otherwise exempt, are required under the Commodity Exchange Act to be traded on organized futures exchanges.

The regulatory split between the SEC and CFTC reflects the historical origin of futures in commodities markets in the agricultural sector and stock markets in the financial sector. This separation makes little sense in a world of hybrid financial instruments and increasingly converged and networked securities and commodities markets. Further, the division of jurisdiction between the SEC and CFTC has led to periodic turf battles between the two agencies. Prior to the Commodity Futures Modernization Act of 2000 (CFMA), disputes between the two agencies led to the 1981 Shad-Johnson Accord, which delineated jurisdiction over securities-based derivatives and which prohibited trading of futures on individual stocks and narrow-based securities indexes. Other jurisdictions developed markets for these products.

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218 The Securities Exchange Act, for example, gives the SEC broad reach in “transactions in securities as commonly conducted upon securities exchanges and over-the-counter markets.” 15 U.S.C. §78b (2005).
219 7 U.S.C. §2(a)(1)(A) (2006) (giving the CFTC exclusive jurisdiction over accounts, agreements, including options, puts and calls, and transactions involving contracts of sale of a “commodity for future delivery, traded or executed on a contract market designated or derivatives transaction execution facility registered pursuant to [the Commodity Exchange Act]”); TREASURY BLUEPRINT, supra note 35, at 44 (noting that the term futures is not defined in the CEA but that a “future” or “futures contract” generally refers to a “highly standardized agreement between two parties to buy and sell a specific asset at a specified price before or upon some set future date”).
220 7 U.S.C. § 6(a) (2006) (“Unless otherwise exempted, contracts for the purchase or sale of a commodity for future delivery in the U.S.” are illegal unless such transactions are “conducted on or subject to the rules of a board of trade which has been designated or registered by the Commission as a contract market or derivatives transaction execution facility for such commodity”).
221 WILLIAM G. FERRIS, THE GRAIN TRADERS: THE HISTORY OF THE CHICAGO BOARD OF TRADE (1988) (discussing the origins of the Chicago Board of Trade); TREASURY BLUEPRINT, supra note 35, at 45 (noting that the Department of Agriculture initially had federal jurisdiction over futures markets and that Congressional CFTC oversight remains in the Senate and House Agricultural Committees).
223 TREASURY BLUEPRINT, supra note 35, at 106-07 (noting distinction between commodities and securities markets in 1930s had been eliminated by the 1970s and that regulatory bifurcation have contributed to a history jurisdictional disputes and led to ambiguity that critics contend has hindered innovation, limited investor choice, harmed investor protection, and encouraged participants to seek other markets, engage in regulatory arbitrage or evade regulatory oversight); Jeremy Grant, SEC and CFTC in Turf Battles, FIN. TIMES, Dec. 4, 2007, http://us.ft.com/ftgateway/superpage.ft?news_id=fro120420071557536656?page=2 ("Turf battles between the SEC and CFTC over which watchdog has jurisdiction over new financial products have been on the rise as products have become more sophisticated and less easily distinguishable between securities (regulated by the SEC) and futures (regulated by the CFTC). Critics say this has slowed product approval and allowed foreign exchanges to bring competing products to the market faster than US rivals.").
225 TREASURY BLUEPRINT, supra note 35, at 108.

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Even after the CFMA, the relationship between SEC and CFTC has “not proceeded smoothly,” and the two agencies have been unable to agree on margin requirements, which some critics contend has hindered growth in U.S. markets. The Federal Energy Regulatory Commission (FERC) may also have regulatory authority with respect to energy trading, which has led to turf battles between FERC and the CFTC.

A number of self-regulatory organizations (SROs) also have regulatory responsibilities in the securities and futures arenas, subject to oversight by the relevant regulator. Such SROs include futures exchanges, the National Futures Association, stock exchanges, and the Financial Industry Regulatory Authority (FINRA). States may also have involvement in the securities regulation arena, albeit with greater limitations since passage of the National Securities Markets Improvement Act of 1996. Regulatory fragmentation is not limited to the securities and futures arenas. Banking regulation is conducted by multiple federal and state regulatory authorities, including five federal regulators: the Federal Reserve Board, Office of the Comptroller of the Currency, Federal Depository Insurance Corporation, Office of Thrift Supervision (“OTS”), and National Credit Union Administration. Since the passage of the McCarran-Ferguson Act of 1945, insurance regulation has remained fragmented and largely at the state level.

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226 Id. (noting that the UK permitted trading of single stock futures, including futures on individual U.S. stocks).
227 Id.
230 GAO, SECURITIES AND EXCHANGE COMMISSION: OPPORTUNITIES EXIST TO IMPROVE OVERSIGHT OF SELF-REGULATORY ORGANIZATIONS, at 1, Nov. 15, 2007 (discussing SROs that operate and govern markets that are subject to SEC oversight); G30, supra note 27, at 213 (discussing role of SROs in U.S. regulatory regime and noting that in securities and futures industry, SROs establish and enforce rules governing member conduct and trading, monitor trading activity to prevent market manipulation, and examine members for financial strength).
231 NSMIA preempted certain securities (“covered securities”) from state substantive securities regulation requirements, although states with filing requirements in place prior to adoption of NSMIA were able to retain notice filing requirements. NSMIA, Pub. L. No. 104-290,110 Stat. 3416 (1996).
The increasing institutional convergence in the financial services industry among banking, securities, and insurance activities is not reflected in federal financial market regulation and oversight. Federal oversight is largely based on different functional regulators whose operational spheres track industry institutional structures of prior eras, reflecting regulatory mismatch with regulated financial services sectors that not infrequently lead to coordination problems. Fixing regulatory mismatch will require legislation that transforms federal financial industry oversight in fundamental ways. Better regulatory fit will likely ameliorate at least some existing coordination problems. Regulators have attempted with varying success to alleviate the problems of regulatory fragmentation through interagency cooperation, although fragmentation even exists within regulatory bodies, as noted in the SEC Inspector General Report concerning SEC oversight of Bear Stearns, which draws attention to lack of coordination between the Trading and Markets and Corporate Finance divisions of the SEC. Interagency cooperation is evident in contractual agreements between regulators. Cooperation between the SEC and CFTC in regulation of security futures is embodied in their 2004 Memorandum of Understanding (MOU). The 2008 SEC MOU with the Federal Reserve establishes a high level of regulatory cooperation between these two regulators.

The potential complexity of regulatory requirements has significant implications for financial market firms, which may need to deal with multiple regulators and regulatory requirements. Regulatory complexity is evident, for example, in the private investment fund arena. Investment companies, particularly hedge funds, which fall largely within the SEC regulatory universe, may also undertake transactions and engage in activities that may pose significant systemic risk, which is not effectively regulated by existing fragmented regulatory frameworks. Although hedge funds such as LTCM issue securities, and are subject to SEC anti-fraud, anti-manipulation, and large trading reporting rules, hedge funds are structured to be exempt from registration and disclosure requirements under the Securities Act of 1933 (“1933 Act”), Securities Exchange Act of 1934 (“1934 Act”), and the Investment Company Act of 1940 (“1940 Act”). Hedge fund and other private fund managers usually satisfy the “private manager exemption” under the Investment Advisers Act of 1940 (“Advisers Act”), but in some circumstances may be

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235 See infra notes ___ to ___ and accompanying text.
236 See infra notes ___ to ___ and accompanying text.
237 See infra notes ___ to ___ and accompanying text.
239 Memorandum of Understanding Between the U.S. Securities And Exchange Commission and the Board of Governors of The Federal Reserve System Regarding Coordination and Information Sharing in Areas of Common Regulatory and Supervisory Interest, July 7, 2008.
240 GAO, supra note 32, at 10.
241 Id. at 10 (noting that hedge funds operate to qualify for exemptions from the 1940, 1933 and 1934 acts).
242 Id.; Investment Advisers Act of 1940, 15 U.S.C. §203(b)(3) (2006) (exempting from registration investment advisers who during the last 12 months had less than 15 clients and who did not hold themselves out to the public as investment advisers or act as an investment adviser to a registered investment company).
required to register as investment advisers. The SEC has attempted to regulate hedge funds more assertively, but was unsuccessful in 2004 in its attempt to require that hedge fund managers register as investment advisers. If their trading activities involve futures, hedge fund managers may also be subject to CFTC regulation and registration as commodity pool operators ("CPOs") or commodity trading advisers ("CTAs") and required to become members of the National Futures Association ("NFA"), a futures industry SRO that monitors CPOs and CTAs. In contrast to CPOs and CTAs, who must join the NFA, no industry SRO exists for investment advisers. Even if exempt from CFTC direct regulation and registration, hedge funds may be subject to CFTC antimanipulation rules. Further, because the Federal Energy Regulatory Commission has had regulatory authority since 2005 with regard to manipulation of energy prices, hedge funds engaged in energy trading may also be subject to FERC oversight. Broker-dealers, a category whose activities increasingly overlap with investment advisers, are subject to 1934 Act registration requirements and requirements of FINRA, a securities industry SRO. The Treasury Blueprint has an intermediate term proposal to harmonize regulation of broker-dealers and investment advisers by adopting an industry SRO framework for investment advisers.

As regulation in the private fund arena illustrates, existing U.S. financial market regulatory structures are not well suited to the pervasive trading activities that now characterize financial markets and do not effectively regulate such activities. In this trading-centered universe, the activities of individual market players do not fall easily within the scope of regulatory enforcement of existing regulators. For example, AIG, a heavily regulated insurance company at

244 SEC, Final Rule, Registration Under the Advisers Act of Certain Hedge Fund Advisers, Dec. 2, 2004 (adopting Rule 203(b)(3)-2, which would have required certain hedge fund managers to register under the Advisers Act); Goldstein v. SEC, 415 F.3d 873, 884 (D.C. Cir. 2006) (invalidating the Hedge Fund Rule as arbitrary and in conflict with the purposes of the Advisers Act); GAO, supra note 32, at 12 (noting that during the period that the Hedge Fund Rule was effective, an estimated 2,534 hedge fund advisers registered with the SEC, 19 percent of whom had withdrawn their registrations by April 2007).
245 National Futures Association Website, Who Has to Register, http://www.nfa.futures.org/registration/who_has_to_register.asp (noting that “all individuals and firms that wish to conduct futures-related business with the public must apply for NFA Membership or Associate status”).
246 Horwich, supra note 228, at 374-75 (noting that §2(h)(2)(C) of the CEA subjects exempt commodities to CEA prohibitions on manipulation); 7 U.S.C. §2(h)(2)(C) (2006).
248 Hung et al., supra note 243, at 17 (noting the elusive boundary between broker-dealers and investment advisers); TREASURY BLUEPRINT, supra note 35, at 13, 119 (noting that the dividing line between broker-dealers and investment advisers is sometimes unclear).
249 TREASURY BLUEPRINT, supra note 35, 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; Hung et al., supra note 243, at 7 (discussing broker-dealer registration requirements and noting that broker-dealers are also subject to FINRA requirements).
250 TREASURY BLUEPRINT, supra note 35, at 13 (“Treasury recommends that investment advisers be subject to a self-regulatory regime similar to that of broker-dealers.”).
both the federal and state level, has subsidiaries that have been major issuers of Credit Default Swaps (CDS), a major OTC derivatives insurance product that is a significant force in financial markets. Although AIG is an insurance company whose main insurance subsidiaries are regulated by the states in which they do business, AIG’s holding company and its subsidiaries are subject to OTS supervision with respect to safety and soundness because AIG has a federal savings bank subsidiary, AIG Federal Savings Bank. Extensive and multiple layers of regulation of AIG failed to avert its near collapse and need for a government bailout and takeover. Regulation of AIG illustrates core features of U.S. financial regulation frameworks that typically determine regulatory oversight by a combination of functional and institutional factors. Under this regulatory framework, regulatory classifications can at times be more important than the nature of the activities occurring within a firm. The SEC is the principal regulator in many, though not all, aspects of securities markets. The SEC does not, however, typically regulate insurance products, even when such products play a significant role in securities markets. While CDS transactions are largely unregulated, bond insurers, which also insure financial instruments such as municipal bonds, are effectively subject to state insurance regulation, principally by the state of New York.

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251 American International Group, Inc. Report on Form 10-K for the Fiscal Year Ended December 31, 2007, at 11, Filed Feb. 28, 2008 (noting that two AIG subsidiaries, AIG Financial Products Corp. and AIG Trading Group Inc. and their respective subsidiaries (called AIGFP) are principals in a broad range of transactions, including CDS and other derivatives transactions).

252 Id. at 13 (“AIG’s insurance subsidiaries, in common with other insurers, are subject to regulation and supervision by the states and by other jurisdictions in which they do business.”).

253 Id. (“In 1999, AIG became a unitary thrift holding company . . . when the Office of Thrift Supervision (OTS) granted AIG approval to organize AIG Federal Savings Bank. AIG is subject to OTS regulation, examination, supervision and reporting requirements. In addition, the OTS has enforcement authority over AIG and its subsidiaries. Among other things, this permits the OTS to 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, AIG Federal Savings Bank.”); Justin Fox, The Government’s AIG Dilemma, Time.com Curious Capitalist Blog, Nov. 10, 2008, http://curiouscapitalist.blogs.time.com/2008/11/10/the-governments-aig-dilemma/ (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.

254 More Background on AIGFP, The Financial Crimes Blog, Oct. 21, 2008, http://alexmasterley.blogspot.com/2008/10/more-background-on-aigfp.html (“In the case of A.I.G., the [credit crisis] virus exploded from a freewheeling little 377-person unit in London, and flourished in a climate of opulent pay, lax oversight and blind faith in financial risk models. It nearly decimated one of the world’s most admired companies, a seemingly sturdy insurer with a trillion-dollar balance sheet, 116,000 employees and operations in 130 countries.”);
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, Sept. 16, 2008 (describing government seizure of AIG in $85 billion transaction in which the U.S. government effectively received a 79.9% equity stake in AIG);
Matthew Karnitschnig, Liam Pleven & Serena Ng, U.S. Throws New Lifeline to AIG, Scrapping Original Rescue Deal, WALL ST. J., Nov. 10, 2008 (describing replacement of original $123 billion AIG bailout with a new $150 billion bailout package).

255 Erik R. Sirri, Concerning the State of the Bond Insurance Industry, at 1, Feb. 14, 2008, Testimony before Subcommittee on Capital Markets, House Committee on Financial Services, (“[T]he Commission does not regulate these financial guarantors, commonly known as monoline insurers. However, the securities markets and their participants, which the Commission does regulate, may be affected by the declining credit-worthiness of the monoline insurers.”).

256 Subcommittee on Capital Markets, supra note 91, at 1 (noting that bond insurers have insured principal and interest payments for municipal bonds since the 1970s and have recently expanded to insuring structured finance...
Activities of insurers of financial instruments may involve risktaking that has significant implications for systemic risk. Current regulatory frameworks do not enable appropriate system monitoring of such risk due to the functional/institutional focus that effectively fragments monitoring of financial system risk across multiple regulatory bodies. Better system wide monitoring of the risks of such activities could help avert types of network effects that have characterized the credit crisis. Although the Federal Reserve has to a greater extent than other regulators monitored systemic risk to financial markets, financial market institutional structures underscore the need for better system-wide regulation of risk. Prior to the full flowering of the credit crisis, the Treasury Department had attempted to address the fragmentation of financial market regulatory structures in its Blueprint report that recommended significant modifications in the U.S. regulatory regime, including merger of the SEC and CFTC.

Financial regulatory architecture is not a good fit for financial market system dynamics. The fragmentary and frequently overlapping architecture of financial market regulatory frameworks in the U.S. is an atypical historical artifact. The networked structure of financial markets requires regulatory approaches that consider financial markets in their entirety, rather than having functional regulators such as the SEC with oversight responsibilities for financial market segments that no longer exist in their original forms. Recognition of these fundamental changes in financial market architecture has led other countries to move towards more modern financial market regulatory models.

2. Costs of the Crisis-Reaction Regulatory Paradigm in Securities Regulation

Current U.S. regulatory approaches also result in costly and at times overlapping regulatory obligations, particularly because new regulatory structures may be imposed on top of existing ones with insufficient attention to the implications of regulatory obligations for the regulated. In the securities arena, the SEC and state regulators are comfortable with this “Byzantine” regulatory architecture. U.S. regulatory frameworks, however, impose significant costs and may even harm U.S. global competitiveness. The Sarbanes-Oxley Act of 2002, a recent

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257 See infra notes ___ to ___ and accompanying text.
258 See infra notes ___ to ___ and accompanying text.
259 Id. at 4 (“The U.S. regulatory structure reflects a system, much of it created over seventy years ago, grappling to keep pace with market evolutions and, facing increasing difficulties, at times, in preventing and anticipating financial crises.”).
260 See infra notes ___ to ___ and accompanying text.
261 See infra notes ___ to ___ and accompanying text.
example of hasty reactive external regulatory intervention, has received significant criticism on account of its consequences for U.S. capital markets’ global competitiveness. Many see a direct connection between the current decline in U.S. dominance of global capital markets and Sarbanes-Oxley. Others emphasize the regulatory costs that come with the multiple overlapping regulatory frameworks and note that the U.S. has 10 federal, state, and industry regulatory bodies where Britain has one, while regulatory costs in the U.S. 15 times those in Britain.

The crisis-reaction paradigm and patchwork U.S. regulatory frameworks also make it difficult for regulators to monitor complex financial networks. Having a more modern regulatory system is by no means a panacea, however, and regulatory responses to the credit crisis have been criticized in jurisdictions with more recently modified regulatory structures. This highlights the fact that managing financial market regulation is an ongoing task that requires constant modification as a result of changing industry structures and events. Although U.S. regulators have been fairly successful at some aspects of coordination, including through the President’s Working Group, the credit crisis highlights the limits of current U.S. regulatory frameworks in regulating system risk. The crisis-reaction paradigm has thus led to fragmentary regulation that too often fails to regulate the system, which may not be a discernible problem when the system runs smoothly, but which can be highly problematic at times of network system failure. Current U.S. regulatory frameworks are costly, inefficient, and entail enormous coordination problems. Regulatory frameworks need to take better account of the activities of

267 GAO, supra note 214, at 36 (“From an overall perspective the system is not proactive, but instead reacts in a piecemeal, ad hoc fashion—often when there is a crisis. During a crisis, or in anticipation of one, no one has the authority and there is no formal cooperative mechanism to conduct risk analyses, prioritize tasks, or allocate resources across agencies”).
268 Avoiding the Next Northern Rock, ECONOMIST, Jan. 31, 2008; Karel Lanno, The Crisis, One Year On, CEPS Commentary, Aug. 7, 2008 (noting that the integrated financial supervisory authority model is no longer the benchmark following Northern Rock and arguing that keeping prudential oversight with the central bank allows better detection of macro-prudential risks); Steel, supra note 36 (noting that the collapse of Northern Rock raises issues about the revamped UK regulatory structure, and that issues related to information and coordination among government agencies and the role of the Bank of England are likely to be reevaluated); G30, supra note 27, at 29 (discussing reappraisal of UK Integrated Approach following Northern Rock bank run).
270 G30, supra note 27, at 222-23 (discussing the high degree of coordination that has developed over time among U.S. regulators).
271 id. at 223 (noting that the President’s Working Group includes the Secretary of Treasury and the Chairmen of the Board of the Federal Reserve, the SEC, and the CFTC and was established to provide a major crisis-coordinating mechanism); TREASURY BLUEPRINT, supra note 35, at 43-44 (noting that numerous formal and informal mechanisms exist that facilitate coordination among regulators).
participants within networks, the incentives of such participants, the types of links that tie such participants together, and the implications of networks for questions of risk.

II. TRADING, INTERPRETATION, AND INCENTIVES

A. Financial Market Networks, System Dynamics, and Trading

1. Technology, Hierarchy, and Financial Market System Dynamics

Discussion of the influence of networks in other contexts has emphasized the meme of networks as a democratizing force.\textsuperscript{272} Yochai Benkler notes that the networked information economy improves the capacity of individuals to “do more for and by themselves [and] . . . enhances their capacity to do more in loose commonality with others” outside of “traditional hierarchical models of social and economic organization.”\textsuperscript{273} Benkler’s vision of networked interactions is reflected in the activities of many day traders, including Japanese housewives who have been mocked on account of their participation in the yen-carry trade.\textsuperscript{274} Prior to the credit crisis, private Japanese citizens traded an average of $9.1 billion a day in online currency trading, which comprised close to one-fifth of global foreign exchange trading volume.\textsuperscript{275} Some of the same technologies that have transformed trading activities in other financial market settings enabled Japanese foreign currency trading by nonprofessionals such as day traders. This trading became a casualty and network effect of the credit crisis, and Japanese private currency traders are estimated to have lost $2.5 billion in currency trading in August 2007 alone.\textsuperscript{276}

Although a less exact fit in financial market institutional contexts, Benkler’s discussion of the networked information economy nonetheless has resonance with respect to the activities of traders in financial markets more generally. Current financial market regulation approaches fail to take sufficient account of how technology and innovative financial instruments have fundamentally transformed the role of individuals, particularly traders, in varied financial market contexts.\textsuperscript{277} In contrast, ethnographic studies of traders highlight the roles of traders in the

\textsuperscript{272} BENKLER, supra note 128.
\textsuperscript{273} Id. at 8-9.
\textsuperscript{274} Martin Fackler, \textit{Japanese Housewives Sweat in Secret as Markets Reel}, N.Y. TIMES, Sept. 16, 2007 (describing Japanese homemakers who “moonlight” as amateur currency speculators and who “emerged as a powerful force, using Japan’s vast wealth to sway prices and confound economists”); Martin Fackler, \textit{In Japan, A Robust Yen Undermines the Markets}, N.Y. TIMES, Oct. 27, 2008 (describing the yen-carry trade, which took place for more than a decade largely through trading of derivatives such as currency options in which Japanese and foreigners borrowed money in Japan, which had very low interest rates, and invested the borrowed Japanese money in higher yielding assets in other places in the world, “from home loans in Budapest and Seoul to equities in Mumbai”).
\textsuperscript{275} Fackler, \textit{Japanese Housewives}, supra note 274 (noting that online currency trading has become a phenomenon in Japan).
\textsuperscript{276} Id.
system dynamics of financial markets and networks.  

Private market discipline might be one way to regulate activities of such institutional market participants. However, as the credit crisis illustrates, current structures of incentives within financial market firms may not give individual actors appropriate incentives to manage and price risk.

The importance of traders, both individually and collectively, challenges existing securities law frameworks, which remain far too fixed on hierarchical assumptions about institutional entities and relationships, particularly with respect to how such entities and relationships affect retail market participants. The institutional focus means that the typical locus of securities regulation and financial market regulation more generally is largely at the entity level, while those protected by such regulations are conceptualized as the average retail investor, who in reality constitutes a “disappearing breed.” The need for regulation with respect to networks among and incentives within institutional participants has received insufficient attention, particularly in the securities regulation arena. This limited vision and institutional focus dominant before the credit crisis has meant that existing regulatory frameworks may fail to apprehend internal dynamics within institutions, the interaction of the institutional with individuals’ choices, and the ways in which such individual choices may be shaped by institutional imperatives. Further, surprisingly little examination has been made about trader behaviors in contexts of market manipulation.

2. Incentives in the ARS Market: Selling “Cash Equivalents” to Investors

An institutional focus has been evident in SEC regulatory responses to the Auction Rate Securities (ARS) market. ARS, which were first issued in 1984, are long-term, variable-rate instruments that have their interest rates reset at periodic and frequent auctions. The ARS market, which collapsed in February 2008, seemingly offered benefits to both issuers and investors. ARS enabled issuers vary their credit spread over time by issuing long-term variable rate debt without setting the interest rate for the life of the instrument at issuance, as would be the case with a traditional variable-rate instrument. Municipalities, student loan companies, and closed-end mutual funds accounted for some 95% of the ARS market.

Investors were told that ARS were a higher-yielding cash equivalent alternative to money market

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278 See infra notes ___ to ___ and accompanying text.
279 BERNSTEIN, supra note 3, at 4 (noting that individual investors buying and selling for their own accounts now represent 16 percent of their financial assets, a decrease from 44 percent in the late 1960s, while odd-lots or transactions of less than 100 share have decreased from 5 percent of total volume to less than 2 percent).
280 John J. Merrick Jr., Narayan Y. Naik & Pradeep K Yadav, Strategic Trading Behavior and Price Distortion in a Manipulated Market: Anatomy of a Squeeze, 77 J. FIN. ECON. 171, 172 (2005) (“Even though there have been innumerable cases of often serious market manipulations reported in securities markets worldwide, surprisingly little is documented about the trading behavior of major players in manipulated markets.”).
282 Id. at 4.
283 Id.; Analysis Group Issue Brief, Auction Rate Securities, at 2, Summer 2008 (noting that as of December 31, 2007, 49% of ARS issuers were municipalities, 26% student loan companies, and 19% closed-end funds).
funds. Because ARS have been sold to sophisticated investors, they are generally exempt from specific federal securities regulation mandatory registration and disclosure requirements. ARS transactions, however, remain subject to federal and state antifraud liability. ARS coupon or dividend rates are reset using “Dutch Auctions” every 7, 28, 35 or 49 days. Prior to the collapse of the ARS market in February 2008, broker-dealers acted as remarketing agents and facilitated auctions. Remarketing agents would survey investor interest and give “price talk” guidance to prospective investors that would indicate the range of rates that the broker-dealer believed the auction would likely clear. Interested buyers and sellers would then submit their bids. At the time of a new auction, new and continuing holders of ARS would receive the rate determined at the auction, while former holders (sellers), who had been receiving interest payments, would be paid par or the face value of their investment. Broker-dealers selling ARS failed to disclose that they used their own capital to support auctions and submitted bids in auctions to ensure that auctions did not fail. Further, some sales to investors by UBS occurred because the UBS risk management department required that UBS reduce its own ARS inventory. In the case of UBS, ARS rates appear to have been actually set by UBS, which attempted to balance the needs of its underwriting clients seeking low financing costs, purchasers seeking higher yields, and its bolstering of its own balance sheet.

The collapse of the ARS market highlights two important trends in trading markets relating to

284 Lee, supra note 281, at 4 (noting marketing that indicated that ARS were equivalent to money market funds); Gretchen Morgenson, As Good as Cash. Until It’s Not, N.Y. TIMES, March 9, 2008, (noting that Wall Street sold ARS as cash equivalents and that ARS historically paid one percentage point more than money market funds); In the Matter of UBS Securities, LLC and UBS Financial Services, Inc., at 1, Commonwealth of Massachusetts, Securities Division, Administrative Complaint, June 26, 2008, Docket No. 2008-0045 (“These [ARS] sales were typically made with the express representation that they were liquid, safe, money-market instruments”); James Stewart, Risks of a ‘Safe’ Investment Are Found Out the Hard Way, WALL ST. J., Feb. 27, 2008 (discussing his experience with ARS sold by Merrill Lynch).


286 Lee, supra note 281, at 4.

287 In the Matter of UBS Securities, supra note 284, at 9 (noting that the last auction led by UBS occurred the day before UBS, without advance notice to its customers, ceased supporting its ARS program).

288 Id.

289 Id.

290 Id.

291 Id.

292 Id.

293 Id.

294 Id.

295 Id.

296 Lee, supra note 281, at 5; John Carney, Did Auction Rate Securities Ever Have a Natural Success Rate?, DealBreaker.com, Feb. 27, 2008 (“[T]he market never had enough buyer demand to support itself and has been dependent on stabilization from the banks for a very long time...But for the banks acting as market makers, these auctions would have failed from the get go,’ a bond trader told DealBreaker.”); In the Matter of UBS Securities, supra note 284, at 3, 40 (noting that UBS Securities submitted support bids in 27,069 auctions and that the support bids were drawn upon to prevent failed auctions in close to 51% of those auctions or 13,782 times).

297 In the Matter of UBS Securities, supra note 284, at 75 (discussing the conflict of interest issues that arose from the process by which UBS set interest rates).
incentives and networks. The ARS market illustrates some ways incentives may shape the behavior of individual market participants. Markets for ARS also demonstrate the extent to which financial markets reflect networks of relationships. The broader credit crisis spilled over to the ARS market in early 2008, when principal dealers in the ARS market stopped supporting ARS auctions, which led to a collapse of the market.\textsuperscript{296} Banks stopped supporting the ARS market due to the stress that credit crisis losses in other markets placed on their balance sheets.\textsuperscript{297} The 2008 problems in the ARS market are not, however, the first time this market has received regulatory attention. In 2006, the SEC reached a $13 million settlement with 15 financial institutions in which the industry agreed to impose a voluntary code of conduct for the ARS market.\textsuperscript{298}

The 2006 SEC settlement focused on sales activities and disclosures made in the process of clearing and selling ARS and addressed some of the exact same issues that have arisen again in 2008, particularly with respect to broker-dealer support of the ARS market to prevent failed auctions.\textsuperscript{299} The settlement did not devote much attention to structures of incentives within financial market firms, especially with respect to compensation, that might have encouraged or discouraged particular practices. This omission is highly relevant to ARS sales patterns because individual brokers had significant incentives to sell ARS. Brokers “were typically paid three to four times more for selling auction rate securities than for other short-term fixed income investments,” and firms and their employees “were highly incentivized to sell” ARS and “keep this niche market alive.”\textsuperscript{300} Wall Street firms made generous fees from issuing ARS and running ARS auctions, with UBS, for example, receiving compensation for underwriting of typically one percent of the outstanding amount underwritten plus auction management compensation of 0.25 percent annualized of the amount managed that was typically shared with employees.\textsuperscript{301} Compensation to employees for selling ARS was far higher than payment for comparable fixed income products. At UBS, financial advisers received no commission if they put investors in a UBS standard money market fund, but received a portion of the 0.25 percent compensation received by UBS, calculated based on their total ARS sales.\textsuperscript{302} In the industry more generally, this 25 basis point compensation compared favorably with 0.05 percent in the case of Treasury

\textsuperscript{296} Amir Efrati & Liz Rappaport, \textit{Auction-Rates a Legal Tangle}, \textsc{Wall St. J.}, May 13, 2008 (noting the extensive role played by Wall Street banks in supporting the ARS market).

\textsuperscript{297} \textit{Id.}


\textsuperscript{299} SEC, Securities Act Release No. 8684, supra note 298, at 5-8.

\textsuperscript{300} SVB Financial Group, \textit{Endgame: How the Auction Rate Securities Crisis Ends}, July 21, 2008, at 2; see also Jacob Zamansky, \textit{Auction Rate Securities Compensation: Peanuts or Icing on the Cake for Brokers}, Zamansky & Associates Blog, April 9, 2008 (suggesting that the fees generated from auctions was a reason that Wall Street firms pushed ARS to investors); Liz Rappaport & Randall Smith, \textit{UBS to Pay $19 Billion As Auction Mess Hits Wall Street}, \textsc{Wall St. J.}, Aug. 9, 2008 (noting that brokers “were paid unusually rich commissions to sell the securities”).

\textsuperscript{301} In the Matter of UBS Securities, supra note 284, at 37-38; Morgenson, supra note 284.

\textsuperscript{302} In the Matter of UBS Securities, supra note 284, at 38-39 (noting that UBS financial advisor Burd received 40 percent of the 25 basis point annualized fee while UBS kept the remaining 60 percent).
securities and plain vanilla money market funds.\textsuperscript{303} Merrill Lynch offered extra commissions of up to 1 percent for ARS sales.\textsuperscript{304}

ARS sellers and auction managers have typically been regulated entities, a number of which had settled with the SEC in 2006 without admitting fault.\textsuperscript{305} The settlement with the SEC did not fundamentally alter a market trajectory, or objectionable ARS auction and sales practices, which is not surprising given the incentives that both banks and their employees had to continue selling securities that were highly profitable to both firms and their employees. In the aftermath of the ARS market collapse in 2008, state attorney generals, FINRA, and the SEC have sued and negotiated settlements with major players that have agreed to repurchase more than $36 billion of ARS from investors,\textsuperscript{306} while the Department of Justice is undertaking a criminal investigation.\textsuperscript{307} A lack of attention to incentives compromised the ability of regulators to effectively regulate the ARS market. Further, by focusing on settling with institutions without truly looking within such entities, regulators failed to halt practices that had a serious negative impact on later investors who suffered from some of the same behaviors that the original settlement was supposed to have addressed.

3. Institutions and Incentives: Market Efficiency and Discipline

The institutional focus in securities regulation reflects assumptions about where and what the “market” actually is and bases of decision making by market participants. A strong belief in private market discipline pervades U.S. financial market regulation.\textsuperscript{308} Private market discipline remains a dominant assumption, at times even in the face of clear evidence that such discipline is tenuous, if not nonexistent. SROs, which are the first line of defense in preserving market integrity and minimizing fraud in the securities and commodities arenas, have successfully filled gaps in existing regulatory frameworks.\textsuperscript{309} The operation of private market discipline should not, however, be a matter of faith, but should be verified empirically and continually monitored. Regulatory actions based on unquestioned assumptions of private market discipline may fail to recognize instances when individuals’ incentives within dominant institutional players are

\begin{itemize}
\item \textsuperscript{303} Rappaport & Smith, \textit{supra} note 300 (noting that brokers and firms shared commissions of 25 basis points for ARS, as compared with 5 basis points for Treasury securities and plain vanilla money market funds).
\item \textsuperscript{304} \textit{Id.}
\item \textsuperscript{306} Liz Rappaport & John Hechinger, \textit{Big Banks Strike Deals With States}, \textit{Wall St. J.}, Aug. 22, 2008 (noting that New York Attorney General Cuomo and regulators representing 48 other states reached multibillion dollar settlements with Goldman Sachs, Deutsche Bank and Merrill Lynch concerning their sales and marketing of ARS); SEC, Bank of America Agrees in Principle to ARS Settlement, Oct. 8, 2008; Rachel Breitman, \textit{Bank of America in $4.5 Billion Auction-Rate Settlement}, \textit{Am Lawyer}, Sept. 11, 2008 (discussing Bank of America settlement with the Massachusetts Secretary of State); Rappaport & Smith, \textit{supra} note 300 (discussing the $36 billion repurchases by UBS, Merrill Lynch and Citigroup); SEC, SEC Finalizes Auction Rate Securities Settlements With Citigroup and UBS Providing Nearly $30 Billion in Liquidity to Investors, Litigation Release No. 20824, Dec. 11, 2008.
\item \textsuperscript{307} Amir Efrati, \textit{U.S Auction-Rate Investigation Picks up Steam}, \textit{Wall St. J.}, Oct. 2, 2008 (discussing Justice Department investigation).
\item \textsuperscript{308} PWG, \textit{supra} note 42, at 30 (outlining reasons for believing in the effectiveness of private market discipline).
\item \textsuperscript{309} \textit{TREASURY BLUEPRINT, supra} note 35, at 122.
\end{itemize}
fundamentally incompatible with any notion of private market discipline.

In addition to ideas about private market discipline, securities regulation and financial market regulatory frameworks more generally assume that capital markets are efficient. Assumptions about private market discipline are often closely linked to views of individual economic actors as rational within broader financial markets that are efficient in aggregate. The efficient capital market hypothesis assumes that in efficient capital markets prices incorporate available relevant information. Although the extent to which markets are actually efficient is disputed, the influence of the efficient markets hypothesis in the legal arena cannot be underestimated. However, the connection of individuals’ behavior and aggregate market assumptions is in many respects problematic. For example, the assumption of efficient markets theory that prices reflect information makes implicit conjectures about how price efficiency is achieved and the actions that individual market participants may take in response to information. Even if such assumptions are true much of the time, they do not encompass the full range of observable behaviors of individuals or the incentives that guide such individuals’ choices. Further, as noted in criticisms of the efficient markets hypothesis, particularly from disciplines such as psychology, individuals’ observed behaviors in reaction to information disclosure do not always reflect what the efficient markets hypothesis would suggest should occur. As events in the ARS market highlight, a range of incentives may shape trading and other activities of individual market participants in ways that may be significant for financial market regulation. Such

310 Jeffrey N. Gordon & Lewis A. Kornhauser, Efficient Markets, Costly Information and Securities Research, 60 N.Y.U. L. Rev. 761, 762 (1985) (noting that the efficient market hypothesis has strongly influenced legal theory as well as prevailing doctrines and regulations); Ronald J. Gilson & Reinier H. Kraakman, The Mechanisms of Market Efficiency, 70 Va. L. Rev. 549, 549-50, 643 (1984) (noting the wide acceptance of the efficient capital market hypothesis in the legal literature and suggesting “that a continuum of market mechanisms keyed to the broad or narrow distribution of trading information is a general analytical tool with value for understanding a wide spectrum both of markets and of their attendant institutional supports”.

311 Lynn A. Stout, The Unimportance of Being Efficient: An Economic Analysis of Stock Market Pricing and Securities Regulation, 87 Mich. L. Rev. 613, 709 n.1 (1988) (“Capital markets are described as ‘efficient’ when stock prices fully reflect all available information relevant to their values.”) (citations omitted); Lucy F. Ackert & Brian F. Smith, Stock Price Volatility, Ordinary Dividends, and Other Cash Flows to Shareholders, 48 J. Fin. 1147, 1147 (1993) (noting that the simple market efficiency hypothesis “implies that movements in stock prices are either due to changes in the discount rate or to new information concerning cash flows, and at any point in time stock prices reflect all available information”); Eugene F. Fama, Efficient Capital Markets: A Review of Theory and Empirical Work, 25 J. Fin. 383, 383, 413 (1970) (reviewing theoretical and empirical work on the efficient markets hypothesis, discussing the weak, semi-strong and strong forms of adjustment to relevant information and noting that efficient markets theory concerns “whether prices at any point in time ‘fully reflect’ available information”).

312 Gordon & Kornhauser, supra note 310, at 797 (“[A] substantial body of empirical work questions whether even the most well- developed capital markets are efficient.”) (citations omitted); Werner F.M. De Bondt & Richard H. Thaler, Further Evidence on Investor Overreaction and Stock Market Seasonality, 42 J. Fin. 557, 579 (1987) (finding evidence consistent with the behavioral view that investors overreact to short-term earnings movements).

313 Stout, supra note 311, at 621 (“The ECMH addresses only how quickly stock market prices react to new information. One could imagine other forms of efficiency that could be desired in securities markets. But no other vision of efficiency has captured the hearts and minds of the securities culture to the degree that informational efficiency.”) (citations omitted)

314 Henry G. Manne, The Welfare of American Investors, Wall St. J., June 13, 2006 (noting that the efficient theory is the most accurate and useful model of aggregate stock market behavior but that the activities of “irrational and less-than-fully informed individuals” or noise traders “were known to abound”).

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incentives highlight complexities in behavior that may depart from typical assumptions made about individual rational actors and aggregate market efficiency.\textsuperscript{315} Top down regulatory approaches devote insufficient attention to behavioral incentives. Further, the broad range of trading practices evident in financial markets remains largely underexamined from a regulatory perspective. Understanding networks and financial market system dynamics requires better appreciation of underlying incentives and trading activities of individuals that such incentives might engender.

Whether capital markets are efficient or not in aggregate, as Warren Buffett has stated, markets are more likely frequently efficient than efficient all the time,\textsuperscript{316} which has potentially significant implications for framing and interpretation in market contexts, as well as financial market regulation. A recent empirical study, for example, suggests that Berkshire-Hathaway’s investment performance is unlikely to be explained by efficient market theory,\textsuperscript{317} which underscores the difficulty in making assumptions about individual performance or behavior based on aggregate theories about financial markets. Discussions of capital market efficiency and private market discipline in legal contexts would benefit from greater consideration of activities and processes, including incentives, at the level of individual participants in addition to the state of markets as efficient or not in aggregate. The need for greater attention to processes is particularly important given the complexities and dense networks now evident in capital markets.

The role of individuals’ incentives is particularly pertinent in the context of trading cultures that had permeated financial markets by the time of the credit crisis. A key question in discussions of efficient markets concerns assumptions made about the marginal trader, who is often assumed to be a rational price arbitrageur.\textsuperscript{318} The institutional architecture of markets and complexity of financial instruments and trading strategies make this assumption questionable.\textsuperscript{319} The best way to evaluate the true extent of private market discipline is through better understanding of the system dynamics and incentives that actually shape market participants’ activities.

B. \textit{Trader Visions and Trading Positions: From Riskless Arbitrageur to Speculative House Better}

Visions of traders as rational price arbitrageurs except perhaps in instances of fraud or trading deemed inappropriate such as insider trading are implicit in regulatory frameworks and related to assumptions about efficient markets and private market discipline. In discussing potential regulatory modifications, for example, the SEC frequently refers to the ways in which a

\begin{footnotesize}
\begin{enumerate}
\item Hu, \textit{supra} note 186, at 1487-1492 (discussing departures from assumptions about rational actors in swap transactions, noting that “decisionmakers are not always economically rational”).
\item Berkshire-Hathaway 1988 Letter to Shareholders (“Observing correctly that the market was frequently efficient, they went on to conclude incorrectly that it was always efficient. The difference between these propositions is night and day.”).
\item \textit{Id.} (distinguishing between aggregate market efficiency and the behavior of individual actors).
\item \textit{Id.} (noting that securities laws based on the “notion of the marginal trader as a rational arbitrageur of price” no longer has “any intellectual merit”).
\end{enumerate}
\end{footnotesize}
particular change will make markets more efficient. The 2005 SEC public offering reforms, which reduced regulatory requirements for public offerings for issuers above a certain market capitalization level, make aggregate assumptions about market efficiency based largely on market capitalization. This reflects an aggregate assumption about markets that implicitly takes for granted that behaviors of market participants will mirror these assumptions. An alternative perspective might look from the bottom-up and look at actual trading activities with respect to different types of issuers and derive assumptions about market efficiency based on the system dynamics of market activities and trading with respect to particular types of companies. This alternative perspective might, for example, take greater account of potential differences in efficient markets for trading activities of smaller issuers that may meet the aggregate capitalization requirements, particularly in a bull market, but that are also thinly traded and not followed by analysts. The market realities of trading activities and information disclosure surrounding such companies may make markets for such companies’ securities less likely to reflect assumptions about informational efficiency than would be the case for companies followed by analysts with greater trading volume.

Recognition of the changing topography of trading cultures is not sufficiently reflected in regulatory frameworks. Visions of markets and traders often involve translation of aggregate assumptions about markets on average to behavioral expectations of individual market participants. This translation process may result in a vision of traders that is fundamentally incomplete. Securities regulation frameworks, for example, treat broker-dealers and investment advisers quite differently. Both broker-dealers and investment advisers are financial market intermediaries that may extensively trade. Further, the activities of market participants falling within these two categories have increasingly converged over time.

320 SEC, Final Rule, Asset Backed Securities, Jan 6. 2005, Release No. 33-8518 (“We believe the servicing criteria will provide value to the ABS industry in establishing market-wide disclosure benchmarks and promote market efficiency by providing meaningful disclosure regarding each party participating in the servicing function that is attested to by the respective party's independent public accountant.”);
321 SEC, Final Rule, Securities Offering Reform, July 19, 2005, Release No. 33-8591 (“We anticipate these rules will improve investors’ ability to make informed investment decisions and, therefore, lead to increased efficiency and competitiveness of the U.S. capital markets. We anticipate that this increased market efficiency and investor confidence also may encourage more efficient capital formation.”).
322 SEC, Form S-3, General Instructions, at II.B.1 and 6 (restricting the use of the Form S-3 for public offerings, which has fewer requirements than Form S-1, largely to issuers meeting certain requirements, including having a public float of $75 million, but permitting certain issuers making limited sales to use Form S-3 even if they do not have a $75 million public float).
323 Peter L. Welsh, Analyst Conflicts, Efficient Markets and “Failure To Supervise” Liability, 18 Legal Backgrounder (Oct. 3, 2003), Washington Legal Foundation (noting that “efficient market hypothesis holds that the price at which a security changes hands in a thickly-traded market includes all of the publicly available information about the particular stock”); Fazal Husain & Kevin Forbes, Efficiency in a Thinly Traded Market: The Case of Pakistan, 4 SAVINGS AND DEVELOPMENT 457, 471 (1999) (finding in empirical study of thinly traded Pakistani market that market adjusts slowly to new information).
325 See supra notes ___ to ___ and accompanying text.
326 See supra notes ___ to ___ and accompanying text.
treatment of broker-dealers and investment advisers are historical artifacts from prior eras that continue to shape regulation, despite changes in financial market activities of both groups. Visions of traders underlying securities regulation frameworks may thus be significantly at odds with the cultures of trading that have emerged in various sectors of financial markets. A corpus of works by social scientists offers a richer vision of traders that illuminates how traders may actually behave in market contexts of uncertainty.

Trading on a particular piece of information involves acts of interpretation, and traders’ behaviors may be “based on a form of reasoning that is far from strict calculation.” Different trading strategies may thus be conceptualized as at times reflecting fundamentally different interpretations of markets. Further, market models, activities, and interpretations may interact dynamically and change significantly over time with changing events and levels of market experience. Mathematical models themselves may shape trading behaviors. The Black-Scholes option pricing model, for example, appears to have led to changes in option pricing patterns. Recognition of trading opportunities may involve use of evaluative principles and judgment that entails sifting through large amounts of data by humans, computers or bots or some mixture thereof. In the case of a rapid price movement, market participants must evaluate available information and determine what constitutes signal and what might be merely noise. Market interpretations and decision making occur in a context of significant market uncertainty and volatility, as well as framing discussed in the behavioral finance literature that has a significant influence on the types of decisions that traders might make.

Investment decisions may also be subject to distortions and error, including overconfidence,
which may affect trading performance.\textsuperscript{334} Successful trading depends on accurately predicting future prices.\textsuperscript{335} Reading and interpreting financial markets requires an understanding of the psychology of markets and is often challenging, particularly given the complex and at times opaque financial market products, trading strategies, and networks that now exist.\textsuperscript{336} A trading market interpretation that reflects an inadequate, inaccurate, or otherwise ultimately incorrect reading of market events can have significant consequences, particularly for institutions within which or investors on behalf of whom the trading activity occurred and for whom such trades may generate significant losses. System dynamics for traders who work on physical exchanges may be even more complex. In such contexts, the timing and visual and aural presentation of trading activities may influence reception of bids.\textsuperscript{337} Regardless of context, trading decisions reflect interpretive processes that are often flexible.\textsuperscript{338} Traders may also in some instances attempt to manipulate markets, which has been evident in trading strategies in both financial markets and political prediction markets.\textsuperscript{339}

Different trading strategies may also use different information. How market participants interpret information and what they see as constituting information plays an important role in the actual operation of markets.\textsuperscript{340} For example, as U.S. option markets matured, option volatility skew became an important piece of information for traders and has been characterized by as the “central cognitive aspect of options trading” at certain points in time on markets such as the Chicago Board Options Exchange (CBOE).\textsuperscript{341} Varied spatial and conceptual structures and uses

\textsuperscript{334} Philip Y.K. Cheng, The Trader Interaction Effect on the Impact of Overconfidence on Trading Performance: An Empirical Study, 8 J. BEHAV. FIN. 59, 66 (2007) (finding that overconfidence generally negatively impacts trading performance and that traders in an interactive environment such as futures pit traders are more overconfident than traders in an isolated environment such as electronic market traders).

\textsuperscript{335} DAS, supra note 12, at 135.

\textsuperscript{336} G.C. SELDEN, PSYCHOLOGY OF THE MARKET (1912).

\textsuperscript{337} Zaloom, supra note 328, at 263.

\textsuperscript{338} Id. at 269.

\textsuperscript{339} Rajesh Aggarwal & Guojun Wu, Stock Market Manipulations, 79 J. BUS. 1915, 1916, 1948 (2006) (noting that manipulative market activities have declined in main exchanges but remain a serious issue in U.S. OTC and emerging financial market and that manipulation is associated with greater volatility, liquidity, and high returns during the period of manipulation); Asim Ijaz Khwaja & Atif Mian Unchecked Intermediaries: Price Manipulation in an Emerging Stock Market, 78 J. FIN. ECON. 203, 235 (2005) (analyzing evidence from the stock exchange in Karachi, Pakistan that is indicative of “manipulation of stock prices by collusive brokers”); Merrick, Naik & Yadav, supra note 280, at 172 (noting that major market manipulation episodes have occurred in bond markets, commodity markets, and equity markets); Franklin Allen, Lubomir P. Litov & Jianping Mei, Large Investors, Price Manipulation, and Limits to Arbitrage: An Anatomy of Market Corners, Dec. 2004, Working Paper, http://ssrn.com/abstract=604302 (finding in empirical study of stock market corners between 1868 and 1980 strong evidence that large investors and corporate insiders possess sufficient market power to permit them to manipulate prices); David Rotschild & Justin Wolfers, Market Manipulation Muddies Election Outlook, WALL ST. J., Oct. 2, 2008; Rhode & Strumpf, supra note 332 (analyzing data from trading in political stock markets, suggesting that manipulative behavior may be the norm and indicating that it may be difficult for traders to manipulate markets in the long run).

\textsuperscript{340} CAITLIN ZALOOM, OUT OF THE PITS: TRADERS AND TECHNOLOGY FROM CHICAGO TO LONDON 97 (2006) ("Speculation is a skill of its own that comes from the ability to negotiate the social layering of the pit and create a self that can read and react to rapidly changing market information.").

\textsuperscript{341} MacKenzie & Millo, supra note 202, at 128-32 (noting use of the Cox-Ross-Rubinstein model (similar to Back-Scholes-Merton, but more flexible) on the CBOE trading floor to generate prices and the development of a distinct
of technologies may inform various trading strategies.\textsuperscript{342} Diverse and complex trading strategies add to financial network complexity, particularly because trading strategies, trading execution, and investment holdings may be intentionally kept opaque to protect trades from being exploited. Maintaining secrecy about trades can help protect trades by preventing others from using information about trading positions to undertake offsetting trades that might drive prices in an opposite direction than anticipated in the trade. Disclosure of its trading positions was one of the factors that exacerbated the plight of Amaranth, one of the largest hedge fund failures to date.\textsuperscript{343}

Ethnographic studies of traders enrich our understanding of some of the complex processes by which financial networks are constituted from the bottom-up. They also suggest that traders pursue varied strategies, using diverse information and risk profiles. Some traders fit the vision of the marginal trader implicit in many discussions of efficiency in capital markets, while others do not.\textsuperscript{344} The vision of the trader as rational arbitrageur makes assumptions about the types of exposure and positions that traders may undertake. Ethnographic studies of trader and the activities of “rogue” traders, however, suggest that the traders may take on significant risk in their trading positions, leading them to “expose themselves profusely” and take bold positions.\textsuperscript{345} Further, some traders may actively buy and sell based on expectations of trading behaviors of other market participants or even traders’ beliefs in their own ability to move the market, which suggests that “riding the bubble” or momentum investing may be an important trader strategy, which reflects strategies that may not be based on market fundamentals.\textsuperscript{346}

Studies of trader behavior thus suggest a more complex picture than may be contemplated under dominant assumptions about efficient capital markets and private market discipline. Trader reputation, for example, influences the trading process and may affect the types of positions that traders make and the reception of a trader by other traders.\textsuperscript{347} Potentially complex relationships...
may exist among market participants that extend beyond conceptions of rational actors and that embed both economic and noneconomic values.\textsuperscript{348} A desire to establish a reputation as an able trader may explain incidents of “rogue” traders such as Nick Leeson, whose $1.4 billion in unauthorized and risky trades led to the collapse of his employer Barings Brothers in 1995.\textsuperscript{349} Both Leeson and Jérôme Kerviel, who is said to have caused a $7 billion loss for French bank Société Générale that was made public in 2008, appear to have had a desire to move from the back office to the trading floor where they sought to establish a reputation as a trader.\textsuperscript{350} Their desire to gain a reputation as a trader may have contributed to their taking on significant exposure and risk that led to enormous losses for their respective employers.\textsuperscript{351} Other rogue traders have caused trading losses at a number of financial institutions, including a $1.1 billion loss at Daiwa Bank disclosed in 1995 after being concealed for 11 years, a $2.6 billion loss at Sumitomo due to unauthorized copper trades in 1996, and a loss of $691 million at Allied Irish Banks discovered in 2005 after being concealed for more than five years.\textsuperscript{352}

Trading may also be based on speculative information such as rumors and gossip,\textsuperscript{353} which has historically been one way that traders seeking to manipulate markets have attempted to move market prices in a particular direction.\textsuperscript{354} Although trading based on false rumors is far from a
new technique, the reach of the Internet has given rumors a huge potential audience.\textsuperscript{355} Trading based on rumors and gossip may explain some aspects of stock market volatility.\textsuperscript{356} Unfounded rumors are thought by some to have been a factor in the collapse of Bear Stearns.\textsuperscript{357} The potential significance of gossip and rumors has even caught the SEC’s attention. The SEC settled its first rumormongering case in 2008 with a proprietary trader who spread false rumors through instant messages to profit from short sale positions in connection with a pending merger transaction.\textsuperscript{358} The rumors caused the stock price of the shorted company to fall by 17 percent within 30 minutes.\textsuperscript{359} This focus on rumors reflects increased SEC scrutiny of short sellers generally in connection with 2008 stock market declines, particularly in stock prices for financial services companies.\textsuperscript{360}

The complexity of trader activities may challenge both regulators and financial market institutions. The credit crisis suggests that many firms integrated in financial market networks do not manage risk very well on two different levels. In the first case, institutional structures do not appropriately identify and monitor risk,\textsuperscript{361} and some firms may not have sufficient internal controls or institutional risk management structures.\textsuperscript{362} Secondly, firms may not provide employees with appropriate incentives for incorporating risk assessment into decision making, may have compensation structures that actually encourage risky trading, and may turn a blind eye to the activities of individual traders as long as a trader’s positions are profitable. The mismatch among incentives, risk, and reward is particularly evident in financial market compensation structures.

C. Trading Returns and Private Market Discipline: Compensation, Incentives and the Internalization of Risk

Widespread inattention to risk is a core factor in the credit crisis and is fostered by financial industry compensation structures. Much discussion of executive compensation in the finance area focuses on payments to senior executives, reflecting a traditional SEC emphasis on senior executive compensation. The recent SEC executive compensation disclosure initiative, for example, focuses attention at the top level of corporate hierarchies.\textsuperscript{363} This same emphasis is

\textsuperscript{356} ROBERT J. SHILLER, IRRATIONAL EXUBERANCE 162 (2d ed. 2006) (noting that word-of-mouth transmission is an important contributor to hourly and daily stock market fluctuations).
\textsuperscript{357} Burroughs, supra note 194 (quoting investment bank vice chairman as stating “‘I don’t know of any firm, no matter the capital, that could have withstood that kind of bombardment by the shorts . . . This was not about capital. It was about people losing confidence, spurred on by rumors fueled by people who had an interest in the fall of Bear Stearns.’”).
\textsuperscript{361} Confessions, supra note 101.
\textsuperscript{362} Matlack, supra note 351 (noting lack of appropriate internal controls at Société Générale).
\textsuperscript{363} SEC, Final Rule, Executive Compensation and Related Personal Disclosure, 71 FED. REG. 53158, 53158-53159 (Sept. 8, 2006) (amending disclosure requirements for executive and director compensation, related person.
evident in the credit crisis bailout.\textsuperscript{364} Focusing on the compensation of senior executive officers reflects a continuing regulatory blindness to the system dynamics of financial networks, changing power dynamics in financial services firms, as well as ways in which compensation in many parts of the industry well below the senior executive level reflects insufficient attention to questions of risk.\textsuperscript{365} Although some recent media commentary has drawn attention to the large bonus payments given many employees of Wall Street firms after the Wall Street bailout,\textsuperscript{366} less attention has been paid to changing structures and power dynamics that have led to traders becoming more powerful in the financial sector more generally. The increased power of traders is a result of the convergence of a number of forces, including the seeming power of traders to move markets, rise of private equity and hedge funds, trader compensation models, and increase in proprietary trading as a core source of revenues for many financial firms.

1. Private Equity and Hedge Fund Traders: Market Movers and Market Compensation Models

Hedge funds represent a new source of systemic risk whose market power is increasingly apparent.\textsuperscript{367} Hedge funds are powerful in part due to their size and their wealth. Further, through their relationships with prime brokers, who provide credit that facilitates hedge fund leverage, the impact of hedge fund trading on financial markets may be potentially amplified.\textsuperscript{368} At the end of 2007, the ten biggest hedge funds in the world controlled $324 billion in capital, an increase of 29% from the prior year.\textsuperscript{369} The top 100 hedge funds controlled an estimated $1.33 trillion in assets in 2007 and could, at least according to pre-credit crisis estimates, reach $3.5 trillion by 2012.\textsuperscript{370} The power of hedge fund traders became apparent to many during a seminal moment in 1992 when George Soros, manager of the Quantum Fund, “broke the Bank of England,” by shorting the pound, forcing the Bank of England to stop defending the pound and permit its devaluation, making a profit of $1 billion.\textsuperscript{371} More than a decade prior to Soros, the Hunt brothers showed the potential power of traders as market manipulators in their failed transactions and corporate governance matters, intended to provided investors with “a clearer and more complete picture of compensation to principal executive officers, principal financial officers, the other highest paid executive officers and directors.”\textsuperscript{366}

\begin{thebibliography}{99}
  \bibitem{365} CRMPG III, \textit{supra} note 18, at 5 (“It is likely that flaws in the design and workings of the systems of incentives within the financial sector have inadvertently produced patterns of behavior and allocations of resources that are not always consistent with the basic goal of financial stability.”).
  \bibitem{368} Philippe M. Hildebrand, \textit{Hedge Funds and Prime Broker Dealers: Steps Towards A “Best Practice Proposal”}, \textit{BANQUE DE FRANCE FIN. STABILITY REV.}, 67, 72 (April 2007); PWG, \textit{supra} note 42, at 2 (noting that hedge funds can enhance liquidity and efficiency but also have potential to disrupt the functioning of financial markets).
  \bibitem{370} \textit{Id.}; MckINSEY, \textit{supra} note 2, at 95.
\end{thebibliography}
attempt to corner the global market for silver. The power of traders to move markets has been illustrated in numerous other circumstances that demonstrate the ability of investor perceptions to shape market reality. Traders engaged in currency speculation are believed by many to have contributed to the Mexican peso crisis of 1994 and currency devaluations and stock market crashes in East Asia in 1997. The potential power of the “shorts” or those who take short positions in anticipation of falling prices, is recognized in the widespread restrictions on short selling that were imposed in 2008 in the midst of the global credit crisis by financial services and securities regulators in the U.S., UK, France, Australia, and other countries.

Other types of private investment funds, including private equity funds, may also engage in significant trading activities. Private equity funds may undertake stock buybacks, issue junk bonds, and sell or refloat company stock. The rise of private equity and hedge funds has led to the creation of a class of highly compensated buy-side market participants. Hedge fund managers receive a management fee of 1 to 2 percent or more annually based on investments under management and incentive fees (carried interest) that typically range from 15 to 25 percent of annual realized performance. Private equity compensation is similarly structured, with management fees of 1.5 to 2.5 percent annually and a carried interest allocation of 20 percent of net profit. These percentages translate in dollar terms into huge payouts for hedge fund managers, who receive enormous sums when their funds perform well, with notably little downside because they are not liable for fund losses (other than to the extent that they have invested personal money alongside their investors). James Simons, a leading hedge fund manager, who profited from shorting subprimes, had earnings of $1.7 billion in 2006. Five hedge fund managers earned more than $1 billion in 2006. The top 25 hedge fund managers earned $14 billion in 2006 and $16 billion in 2007. The top hedge fund manager in 2007

372 Kurt Eichenwald, 2 Hunts Fined and Banned from Trades, N.Y. TIMES, Dec. 21, 1989; CHANCELLOR, supra note 1, at 252 (noting that the Hunts were part of a silver pool that amassed the equivalent of half the world’s deliverable supply).
373 CHANCELLOR, supra note 1, at 332-333.
374 ld. at 332-33, 337-38 (noting that criticisms of hedge funds increased after the 1997 Asian crisis and the assertions by the prime minister of Malaysia and government of Hong Kong that hedge funds were attacking and destabilizing their currencies); LHABITANT, supra note 371, at 337; Eric Ghysels & Junghoon Seon, The Asian Financial Crisis: The Role of Derivative Securities Trading and Foreign Investors in Korea, 24 J. INT’L MONEY & FIN. 607, 628 (2005) (noting that the four countries hardest hit by the Asian crisis suffered a decline in stock market capitalization of 70%, examining the role of index futures during the Korean market crash and finding that the presence of foreign investors played a key role in Korean stock market turbulence).
376 CHANCELLOR, supra note 1, at 255-56; JACK S. LEVIN, STRUCTURING VENTURE CAPITAL, PRIVATE EQUITY, AND ENTREPRENEURIAL TRANSACTIONS ¶105.4, at 1-; ¶105.6, at 1-; ¶501.2, at 5- (2007).
378 LEVIN, supra note 376, at ¶1002.1, at 10-; ¶1004, at 10-.
earned $3.7 billion, while the top 50 hedge fund managers earned $29 billion, or an average of $581 million each.\(^\text{382}\) In 2008, publicly-traded New York private equity and hedge fund group Fortress gave a star trader an options package valued at $300 million as a retention bonus.\(^\text{383}\) Hedge funds and private equity now define the top tier of compensation to which many financial market participants now aspire and exemplify the changing relationship between buy-side and sell side trading more generally, including with respect to compensation, where buy-side remuneration increasingly rivals the sell side.\(^\text{384}\)

2. Wall Street Traders: The Rise of Proprietary Trading

On Wall Street prior to the credit crisis, proprietary house trading that risks the firm’s own capital had become increasingly important,\(^\text{385}\) which is yet another factor underlying the increasing power of traders in the financial services sector more generally. In the not so distant past, Wall Street firms earned most of their revenue from fee-based businesses, including M&A advisory, equity and debt underwriting, and asset management.\(^\text{386}\) Trading revenues have enabled big investment banks to post “spectacular” financial results based on billion-dollar gains made by traders risking bank capital.\(^\text{387}\) Proprietary trading has become a core, albeit at times volatile, source of revenue for a broad range of firms,\(^\text{388}\) reflecting a form of institutionalized speculation that “became an appealing route to quick profits and large bonuses.”\(^\text{389}\)

From 2000 to 2006 trading revenues “jumped from 41% to 54% of revenues for the five largest investment banks, rising to $70 billion a year.”\(^\text{390}\) In 2005, Goldman achieved then record high profits, due in large part to its trading gains, with net revenues from trading and principal investments of $16.4 billion, 23 percent higher than the previous year and close to 70 percent of its revenues for that year.\(^\text{391}\) Trading constituted 60 to 70 percent or more of Goldman revenue and profits between 2001 and 2007.\(^\text{392}\) Financial results at other major investment banks

\(^{384}\) *The Great Migration*, ADVANCED TRADING (Jan-Feb. 2006).
\(^{385}\) Shawn Tully, *What’s Wrong with Wall St. – and How to Fix It*, FORTUNE, April 1, 2008 (“Wall Street firms used towering leverage to make lottery-like loot in a long-running bull market that blatantly underpriced risk. Now that run is over, and the price of risk is rising dramatically.”).
\(^{386}\) Tully, * supra* note 385.
\(^{387}\) Rose-Smith, * supra* note 391.
\(^{388}\) Financial statement volatility has increased for some financial market firms recently due to the adoption of mark-to-market accounting. See infra notes _ to ___ and accompanying text.
\(^{389}\) CHANCELLOR, * supra* note 1, at 252-53.
\(^{390}\) Tully, * supra* note 385.
reflected a similar profile in which trading is a dominant source of both revenue and profits. Merrill Lynch, Bear Stearns and Morgan Stanley financial results reflect proprietary trading activities as constituting a large and potentially volatile source of revenue and profits. Commercial banks may also garner significant portions of their revenues from trading transactions. From 2005 to 2007, J.P. Morgan Chase principal revenues, which include revenues from trading and private equity gains, constituted the second largest source of company revenues. Profits from principal transactions were also volatile at J.P. Morgan Chase during this same time period.

3. Trader Compensation: Risk, Incentive, and Reward

The dominance of trading as a source of revenues for Wall Street firms has significant implications for employee compensation. Wall Street traders make enormous amounts of money by most standards other than the hedge fund one, much of it incentive compensation based on performance. Wall Street trading revenues flow directly down to traders, who essentially receive, in the form of bonuses, a portion of revenues generated from their trades. Wall Street firms “typically pay out about half their revenue as compensation.” In 2007, employees at Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley received 60% of total revenues as compensation. In contrast, commercial banks such as J.P. Morgan Chase and Bank of America paid 32% and 28% of total revenue to employees in 2007. The importance of trading revenues and potential competition from high paying private equity and hedge funds mean that both hedge fund managers and proprietary traders at investment banks are highly compensated, albeit on scales of a different magnitude.

393 Lehman Brothers Holdings, Inc., 2007 Annual Report on Form 10-K, at 47, filed Jan. 29, 2008 (reflecting that Lehman Brothers capital markets revenues, which includes trading and market making in fixed income, equities and derivatives transactions, as well as research coverage, constituted 64 to 68 percent of net revenues and 70 to 80 percent of income before taxes in 2005 to 2007).
394 Merrill Lynch & Co., Inc., Annual Report on Form 10-K, at 102, filed Feb. 25, 2008 (reflecting Global Markets and Investment Banking (GMI) revenues, which also include revenues from investment banking activities, as ranging from negative 24 percent of net noninterest revenues to just over 54 percent of net noninterest revenues between 2005 and 2007, with GMI losses in 2007 of $16 billion constituting 127 percent of Merrill’s overall loss of almost $13 billion); The Bear Stearns Companies Inc., 2007 Annual Report on Form 10-K, at 124, filed ________, 2008 (reflecting capital markets activity as constituting between 48 and 67 percent of net revenue from 2005 to 2007); Morgan Stanley Group, 2007 Report on Form 10-K, at 47, filed Dec. 19, 2007 (reflecting principal transaction (trading) net gains rising to almost $1.8 billion in 2007, up close to 170 percent from just under $700 million of trading gains in 2006, largely as a result of investments “associated with the Company’s real estate products and private equity portfolio”).
395 JPMorgan Chase & Co., 2007 Report on Form 10-K, at 31, filed Feb. 29, 2008 (reflecting revenues increasing from $8 billion in 2005 to almost $11 billion in 2006, before declining to just over $9 billion in 2007, constituting 20 to 26 percent of noninterest revenue and approximately 13 to 17 percent of total net revenue during the 2005 to 2007 period).
396 Id. at 40 (reflecting profits increasing from almost $6.5 billion in 2005 to over $9 billion in 2006, before decreasing markedly to just over $4 billion in 2007).
398 Tully, supra note 385.
399 Id.
In 2004, the bottom ranked person on the Institution Investor top hedge fund list made $65 million, which was more than the combined pay of the CEOs of Goldman Sachs, Morgan Stanley and JPMorgan.\textsuperscript{400} In 2005, Mark McGoldrick, co-head of proprietary investments at Goldman Sachs, is reported to have taken home a bonus of $40 million, which was more than then CEO Hank Paulson’s bonus of an estimated $35 million.\textsuperscript{401} In that same year, Merrill Lynch was estimated to have dispersed a record-breaking $32 billion in bonuses.\textsuperscript{402} In 2008, Thomas Montag, a former star trader at Goldman, started work at Merrill Lynch with a guaranteed $40 million for five months of work.\textsuperscript{403} Goldman Sachs was ultimately unable to retain Mark McGoldrick, who in 2007 remained one of Goldman’s highest paid employees.\textsuperscript{404} McGoldrick’s $70 million annual compensation made him feel underpaid relative to counterparts at hedge funds and private equity firms.\textsuperscript{405}

The highest paid person on Wall Street in 2006, Lloyd Blankfein, head of Goldman Sachs, earned $54.3 million in salary, cash, restricted stock and stock options,\textsuperscript{406} which is far less than the average of $581 million each earned by the top 50 hedge fund managers in 2007. The extraordinary compensation of many hedge fund managers has led to expectations of higher payment among traders at all levels across the board.\textsuperscript{407} High levels of trader salaries are by no means new. A number of trader salary reports reflect generally high compensation for traders worldwide, with senior traders reportedly earning bonuses of as much as $10 to $20 million.\textsuperscript{408} Despite the credit crisis,\textsuperscript{409} reported bonuses for various types of traders continued to remain high in 2007, ranging from $500,000 to $5 million.\textsuperscript{410} In 2008, investment banks have made

\begin{thebibliography}{100}
\bibitem{400} Rose-Smith, supra note 391.
\bibitem{401} \textit{Id}.
\bibitem{402} \textit{Id}.
\bibitem{403} Giannone, supra, note 397.
\bibitem{405} \textit{Id}.
\bibitem{407} Steve Fishman, \textit{Get Richest Quickest}, N.Y. MAG., Nov. 15, 2004 (“In the past few years, running a few hundred million dollars for a hedge fund—and taking tens of millions for yourself—has become the going Wall Street dream.”).
\bibitem{408} Jeanne Sahidi, \textit{How Much is Too Much Pay}, CNNMoney.com, Nov. 29, 2004, http://money.cnn.com/2004/11/24/commentary/everyday/sahadi/index.htm (discussing a 2004 salary report suggesting that senior bond traders would typically earn a salary of $200,000, or roughly the same salary as an investment banker, but would receive a bonus of $1.4 million, roughly double what an investment banker would receive).
\bibitem{409} James Rossiter, \textit{Bonus Boost for Energy Traders}, thisismoney.co.uk, Dec. 12, 2005, http://www.thisismoney.co.uk/news/article.html?in_article_id=405670&in_page_id=2 (noting that energy traders in 2005 in London received bonuses ranging from £3 to £6 million, with a senior energy trader at Goldman Sach’s earning a $10 million bonus, while a senior trader in London was reported to have a package in excess of $20 million).
\bibitem{410} \textit{London Trader Bonuses Top Those in U.S. – Survey}, Mar. 26, 2006, Reuters UK, http://uk.reuters.com/articlePrint?articleID=UKL23613942007325 (noting that managing directors in exotic credit trading, which involves “sophisticated structuring of corporate finance deals” were the highest paid position in a 2007 UK trader salary survey, with salaries ranging from $250,000 to $300,000 and bonuses from $3.2 to $4 million in the UK, U.S. and Asia); Ivy Schmerken, \textit{Trading Bonuses: What Can You Expect to Bring Home This Year?}, AdvancedTrading, Sept. 26, 2007 (noting that in 2007, OTC traders in the U.S. were said to receive bonuses

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extensive cuts, shedding an estimated 75,000 workers, and incurring more than $400 billion in writeoffs. Despite an anticipated fall in bonuses of 30 to 40 percent, existing compensation models appear to remain robust, and Morgan Stanley recently announced that it will redeploy some of the $1 billion it will save from 4,800 job cuts to recruit top executives.

Trader compensation creates incentives for traders to undertake high-risk high-return trades. As Raghuram Rajan, former chief economist at the International Monetary Fund, has noted:

The managers who blew a big hole in Morgan Stanley’s balance sheet probably earned enormous bonuses in the past . . . If Morgan Stanley managed its compensation correctly those bonuses should be clawed back and should be enough to pay those who did well this year without increasing the bonus pool . . . unless we fix incentives in the financial system we will get more risk than we bargain for.

The widespread presence of traders at a variety of firms whose compensation may increase with greater risktaking magnifies financial network risk, which in the credit crisis was an important factor contributing to network failures in significant financial market segments. Compensation structures do not incentivize traders to properly frame and price risk or internalize the risks they take on in their trading. Bonuses are typically rewarded annually, while the true risks of trading positions for which bonuses might have been given may not be as apparent within a short timeframe and could emerge on a longer time horizon. This means that the framing of decision making within this bonus culture has significant potential to lead to traders taking on significant risk and in a sense, gambling with other people’s money. Traders’ time horizons may also have an impact on market efficiency. One empirical study notes that information-based asset pricing models implicitly assume a long time horizon and suggests that short time horizons can lead to information inefficiencies in which traders focus on one source of information rather than a diverse set of data that might influence asset prices on a longer time horizon.
Trading positions may in some instances also be highly leveraged, which means that a wrong trading bet could cause considerable losses and in some instances wipe out the fund or the company and have significant negative ramifications for financial networks and the broader economy. Trading network effects may, for example, result from hedge fund trading activities, which may have a major impact on public markets. Hedge funds are responsible for a significant proportion of market trading activity in a number of markets, including a 20% share of global volume in foreign exchange markets in 2007, 30% of U.S. fixed income trading, 55% of U.S. activity in derivatives with investment grade ratings, 55% of trading volume for emerging market bonds, more than 80% of trading activity in derivatives with high yield ratings, and more than 85% of volume in distressed debt. The widespread presence of hedge fund and other active traders in financial markets means that hedge funds or other investors that need to sell holdings to cover losses could have a significant negative impact on markets more generally, which may reflect a network effect flowing directly into public markets. The sales by Société Générale in January 2008 to unwind rogue trader Kerviel’s positions are thought to have had this type of impact on markets.

D. Network Failure: Firm Structure and Institutional Risk Management

Traders are typically employees, partners or managers of limited liability entities. As a result, they and their colleagues have little risk of being personally liable for trading losses, even if such losses diminish or obliterate investor or shareholder value, or impose significant costs on society. In some instances, traders may be subject to after the fact civil or criminal charges based on antifraud or market manipulation. Current incentives structures may even encourage traders to defraud their employers or fund investors by inflating trading results to ensure higher compensation or acting to delay revelation of trading losses. Being involved in blowing up a hedge fund has not limited future career options in a number of even high-profile cases. All of

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419 McKinsey, supra note 2, at 95 (noting that the growing size of hedge funds could destabilize financial markets).
422 Nelson D. Schwartz & Nicola Clark, Société Générale’s Sales May Have Incited Market Plunge, N.Y. TIMES, Jan. 26, 2008 (discussing how Société Générale’s unwinding of rogue trader Kerviel’s positions pressured markets worldwide, are thought to have led to global market declines, and been a factor in an emergency Federal Reserve interest rate reduction).
425 James M. Clash, Robert Lenzner & Michael Maiello, The $500 Billion Hedge Fund Folly, FORBES, Aug. 6, 2001 (noting that Michael Berger, Joseph Jett and John Meriwether of LTCM all found opportunities after messing up); Partnoy, supra note 415, at 183 (noting that Kidder Peabody trader Joseph Jett, whose trades generated $350
the principals at LTCM returned to working in the hedge fund industry after the LTCM collapse.  

Limited liability and existing compensation structures mean that traders in a broad range of financial market settings may not have sufficient incentives to take account of the risks that their trading activities might create. Incentives at the level of individual traders flow up through entities and may lead to broader failures to internalize risk at the firm level, thus contributing to what has been characterized as the privatization of profit and the socialization of losses. As a result, traders may profit from their trading activities through bonuses but not have their profits be risk adjusted to reflect the true costs of the positions they take, leaving others to absorb losses once they become apparent. Pervasive financial networks may lead to network effects, which means that unless a firm is adequately capitalized, the effects of a firm losses will not be absorbed within the firm but will flow through a firm’s equity holders outward to the firm’s counterparties and creditors and even the broader society. Investment and commercial banks were in the first wave of credit crisis stresses and failures. Hedge fund liquidations, however, increased significantly in the third quarter of 2008. Some suggest that hedge fund difficulties may continue to increase due to likely investor redemptions. In yet another network effect of the credit crisis, by the fourth quarter of 2008, the credit crisis has already had a significant impact in the private fund arena on both venture capital and private equity firms.

Financial market institutional structure has also played a role in the credit crisis. Most investment banks have gone public in the last 20 to 30 years, with Goldman Sachs going public last in 1999. Going public exposed formerly private investment bank partnerships to

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million in losses for Kidder Peabody, was acquitted of securities fraud, avoided damages from civil lawsuits and revived his career, becoming chief investment officer of a multimillion dollar offshore investment fund.

426 DAS, supra note 12, at 175 (noting that Meriwether and Scholes started new hedge funds, the latter with others from LTCM).

427 Martin Wolf, supra note 1, at 175 (noting that Meriwether and Scholes started new hedge funds, the latter with others from LTCM).


430 Pui-Wing Tam & Craig Karmin, Venture Capital Hits a Cash-Call Crunch, WALL ST. J., Dec. 8, 2008, (“Cash-strapped investors are starting to renege on their commitments to venture-capital funds, dealing a blow to an industry that has been the bedrock of Silicon Valley start-ups.”); Julie Creswell, In Private Equity, the Limits of Apollo’s Power, N.Y. TIMES, Dec. 8, 2008 (discussing the challenges private equity firms face in persuading banks and investors to give them more money).

431 CHANCELLOR, supra note 1, at 252 (noting that several leading investment banks, including Morgan Stanley, went public in the 1970s).

432 Lewis, supra note 47 (noting that a share of Salomon Brothers purchased at its market price in 1986 of $42 would be worth roughly $27 in Citigroup, which acquired Salomon Smith Barney, stock today); James Surowiecki, Public Humiliation, THE NEW YORKER, Sept. 29, 2008 (noting some implications of investment banks going public
extensive mandatory disclosure requirements, which do not appear to have been very effective in protecting their investors. However, cultural factors were likely in the end far more important in shaping events than were regulations intended to protect banks’ investors.\textsuperscript{433} Bonus culture has remained an enduring factor in Wall Street compensation structure.\textsuperscript{434} Changing industry ownership structures and regulation as public companies also did little to challenge persistent bonus culture, but rather served to transfer financial risk from principals engaged in transaction to shareholders of Wall Street firms.\textsuperscript{435} Once public, Wall Street firms became black boxes financed by shareholders who “had no real understanding of what the risk takers were doing, and as the risk-taking grew ever more complex, their understanding diminished.”\textsuperscript{436}

As hedge fund blowups, rogue traders, and the plethora of credit-related writedowns in 2007 and 2008 attest, risk control and risk management systems are lacking many financial market firms.\textsuperscript{437} At Société Générale, for example, “rogue” trader Kerviel’s trading positions had reached more than $73 billion, which is far greater than Société Générale market capitalization of $50 billion.\textsuperscript{438} Risk management failures have been in part a product of market complexity, particularly with respect to CDOs and other structured products, where many took the investment-grade ratings at face value without actually taking time to understand the true risks of the products they traded or purchased.\textsuperscript{439} Risk analysis of structured products also generally failed to take account of the significance of their networked nature of financial markets and the

\textsuperscript{433} Preliminary Working Draft – Do Not Cite without consent
ways in which a liquidity crunch might influence such markets. \textsuperscript{440} Internal institutional tensions between traders and risk management also contributed to financial institutions keeping assets that involved far more liquidity risk than risk assessment models might have indicated. \textsuperscript{441} The credit crisis also unfolded along with significant changes accounting rules for derivatives that required reporting in company financial statements at their fair value (i.e., marked-to-market), which increased financial statement volatility. \textsuperscript{442}

The market volatility that came with the credit crisis, however, went far beyond financial statement volatility. Internal risk management at many firms was not well positioned to cope with the market volatility that came with the credit crisis. \textsuperscript{443} The ability of many firms to successfully sustain such volatility has been hindered by a number of factors, including inadequate risk management, high leverage, and compensation structures that have encouraged speculation and incentivized risky trading. Mathematical risk models may have also lent “credibility and false precision to the dismal reality of risk management.” \textsuperscript{444} Use of derivatives may 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 be available. Risk assessments were thus shaped by market assumptions that were incomplete. \textsuperscript{445}

E. \textit{Regulation, Deregulation, and System Dynamics: The Commodity Futures Modernization Act}

Risks of derivatives for financial market and networks have been exacerbated by an emphasis on deregulation that may assume private market discipline where little such discipline exists. Further, an overriding emphasis on deregulation, particularly in the financial markets arena, may translate at the individual level into a license for unfettered risk taking in pursuit of cash rewards: “[a]t some point principled laissez-faire gives way to a widespread acceptance of shortcuts in the

\begin{itemize}
  \item \textsuperscript{440} \textit{Id.}
  \item \textsuperscript{441} \textit{Id.; CRMPG, supra note 18, at 9 (noting the need monitoring functionality within financial institutions that is truly independent of front-line business unit personnel).}
  \item \textsuperscript{442} \textsc{Financial Accounting Standards Board (FASB)}, \textsc{Statement of Financial Accounting Standards 133: Accounting for Derivative Instruments and Hedging Activities} (June 1998); FASB, \textsc{Statement of Financial Accounting Standards 157: Fair Value Measurements} (Sept. 2006); SEC Office of the Chief Accountant and FASB Staff, Clarifications of Fair Value Accounting, Press Release 2008-234, Sept. 30, 2008 (relaxing mark-to-market accounting requirements); Carrie Johnson, \textsc{SEC Loosens Accounting Rule Banks Blame for Crisis}, \textsc{Wash. Post}, Sept. 30, 2008; Ira Kawaller & John Ensminger, \textit{The Fallout from FAS 133}, 23 \textsc{Reg. 22} ([2001]) (noting that some industry experts fear that including the fair value of derivatives on balance sheets could “exacerbate income volatility and give the appearance that companies are operating irresponsible or taking unnecessary risks”).
  \item \textsuperscript{443} James Surowiecki, \textit{That Uncertain Feeling}, \textsc{New Yorker}, Sept. 1, 2008, http://www.newyorker.com/talk/financial/2008/09/01/080901ta_talk_surowiecki (discussing market volatility and noting that “[p]recipitous falls in the market have frequently been followed immediately by sharp rallies, and vice versa.”).
  \item \textsuperscript{444} \textsc{Das, supra note 12, at 179; CRMPG III, supra note 18, at 10-12 (noting failures in industry risk models and that the qualitative and quantitative factors involved in estimation of risk and that risk estimation is more art than science).}
  \item \textsuperscript{445} \textsc{El-Erian, supra note 178, at 145.}
\end{itemize}
pursuit of self-interest, and from there it is but a short step to outright dishonesty."^{446} Creating an effective regulatory architecture requires correct identification of what should be regulated. Discussions of regulation and deregulation often fail to focus on how regulation should derive from the architecture of the system being regulated. Although financial market architecture has increasingly reflected network system dynamics, U.S. regulatory structures to a large extent retain the assumptions of earlier industry business models.

In the context of the 1980s and 1990s, when a deregulation ethos become more prominent, many correctly pointed out that regulatory regimes governing financial markets were onerous and hindered beneficial innovations.^{447} This led significant deregulation and decreased supervision of financial market activities,^{448} leading the “carefully regulated zoo of the 1950s . . . to be reconstituted as a jungle.”^{449} Rather than modify regulatory architecture to track changing financial market architectures, financial market deregulation rested largely on unverified beliefs about the behavior and discipline of market participants that did not sufficiently consider the system dynamics of financial networks, including incentives within financial market firms.

Regulation of OTC derivatives exemplifies approaches to deregulation in the 1980s and 1990s. The Commodity Futures Modernization Act (CFMA),^{450} which significantly modified the Commodity Exchange Act (CEA),^{451} clarifies that OTC derivatives are largely outside the jurisdictional reach of the CFTC.^{452} Section 103 of the CFMA (“Legal Certainty for Excluded Derivative Transactions”) establishes that the CEA does not apply to transactions in “Excluded Commodities” depending on the sophistication of the parties and the location and nature of execution of the contract.^{453} The CFMA was a response to changing financial market industry architecture that had led to significant convergence in exchange-traded and OTC derivatives and a need for clarification of the boundaries of CFTC regulatory reach.^{454} The CFMA was adopted

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^{446} CHANCELLOR, supra note 1, at 271.

^{447} Remarks of SEC Commissioner Barbara S. Thomas, Responsible Deregulation, at 8, 10-12, April 28, 1981, http://www.sec.gov/news/speech/1981/042881thomas.pdf (discussing the broader context of financial market deregulation efforts, the ways in which proponents of deregulation paradoxically sought to regulate regulatory agencies into deregulation, and questions of risk that are of concern in any deregulatory endeavor).

^{448} CHANCELLOR, supra note 1, at 249-50 (discussing attitudes towards deregulation beginning in the 1980s, which led to a lack of rigorous enforcement of regulatory structures and reduction in the SEC’s budget, for example).

^{449} SOBEL, supra note 6, at 83.


^{453} “Excluded Commodities” involve transactions between Eligible Contract Participants, who are presumed to be sophisticated, that are not conducted on a Trading Facility or between Eligible Contract Participants on a principal-to-principal basis on an Electronic Trading Facility. “Excluded Commodities” are defined broadly to include “interest rate, exchange rate, currency, security, security index, credit risk or measure, debt or equity instrument, index or measure of inflation, or other macroeconomic index or measure” and instruments based on other measures, rates, occurrences and contingencies, while “Eligible Contract Participants” include a wide range of regulated financial institutions, insurance companies, broker dealers and investment companies, as well as commodity pools, employee benefit plans, governmental and other individuals and entities that meet certain asset thresholds. CFMA at §103 (amending Section 2 of the CEA); CFMA at §101(13) (amending Section 1a of the CEA); CFMA at §101(12) (amending Section 1a of the CEA); see also TREASURY BLUEPRINT, supra note 35, at 47.

^{454} Horwich, supra note 228, at 374-375 (describing the structure of futures regulation created under the CFMA).
in part based on the recommendations in a 1999 President’s Working Group (PWG) Report on OTC derivatives.\textsuperscript{455} The adoption of the CFMA represented an explicit repudiation of the views of Brooksley Born, then Chairperson of the CFTC, who in 1998 warned of the dangers of leverage in connection with OTC derivatives transactions and recommended greater regulation of OTC derivatives.\textsuperscript{456} The PWG, which included the Secretary of Treasury, Chairman of the Federal Reserve, Chairman of the SEC and Chairman of the CFTC, specifically recommended exclusions from the CEA for transactions involving sophisticated counterparties, including eligible swap participants that are otherwise subject to regulation.\textsuperscript{457}

The CFMA and PWG report are based on assumptions about private market discipline and the ability of sophisticated counterparties to manage risk that appear highly questionable in light of events at the time such as LTCM, as well as the credit crisis. The PWG report, which was issued just after the collapse of LTCM, assumes that sophisticated parties in exempt OTC derivatives transactions do not need the protection of regulation that retail investors need: “[t]he members of the Working Group agree that there is no compelling evidence of problems involving bilateral swap agreements that would warrant regulation under the CEA . . . The sophisticated counterparties that use OTC derivatives simply do not require the same protections under the CEA as those required by retail investors.”\textsuperscript{458} In addition, the PWG report asserts that clarification of the regulatory status of OTC derivatives would enable better management of systemic risk: “legal certainty for OTC derivatives and their execution and clearing will help to reduce systemic risk in the U.S. financial markets and enhance the competitiveness of the U.S. financial sector.”\textsuperscript{459} This perspective fails to take sufficient account of the networked nature of financial markets and the implications of networks for systemic risk. Truly assessing the assumptions underlying the PWG view requires understanding the system dynamics of financial markets and the incentives of market participants at all levels. The PWG perspective also does not adequately consider the protection that others might need from the consequences of bad OTC derivatives bets made by sophisticated parties driven in some cases by self-interest and greed.\textsuperscript{460}

Although the PWG report emphasizes the importance of transparency, it sees government regulation as supplementing rather than replacing private market discipline.\textsuperscript{461} The PWG report falls short, however, in conceptualizing how such private market discipline would actually occur or considering the role of regulation in instances where private market discipline might fall short or fail. The regulatory architecture that emerged after the CFMA failed to include sufficient

\textsuperscript{455} T\textsc{reasury B}\textsc{luep}\textsc{rint, supra} note 35, at 46; P\textsc{WG}, O\textsc{ver-t}he-C\textsc{ounter D}erivat\textsc{i}ves M\textsc{arkets and the C}ommodity E\textsc{xchange A}ct, at 1, Nov. 1999.
\textsuperscript{456} B\textsc{rooksley B}orn, T\textit{he L}\textsc{e}\textit{ss}ons of L\textsc{ong-T}\textit{erm C}\textit{apital M}\textsc{anagement}, O\textit{ct.} 15, 1998 (noting that leverage in OTC derivatives transactions “may pose grave dangers to our economy” and noting “an immediate and pressing need to address possible regulatory protections in the OTC derivatives market”); A\textit{nthon}y F\textit{aiol}a, E\textit{llen N}akashima & J\textit{ill D}rew, W\textit{hat W}ent W\textit{rong}, W\textsc{ash}. P\textsc{ost}, O\textit{ct.} 15, 2008 (discussing the failure of Brooksley Born’s efforts to regulate OTC derivatives and the firm opposition to such regulation by Federal Reserve Chairman Alan Greenspan, Treasury Secretary Robert Rubin, and SEC Chairman Arthur Levitt Jr.).
\textsuperscript{457} P\textsc{WG, supra} note 455, at 2-3, 34.
\textsuperscript{458} Id. at 15-16.
\textsuperscript{459} Id. at 6.
\textsuperscript{460} See g\textit{enerally} P\textit{artnoy, supra} note 415.
\textsuperscript{461} P\textsc{WG, supra} note 455, at 34.
regulatory structures that might encourage private market discipline or mandate it in instances where such discipline failed. The deregulatory ethos in the PWG report also discouraged the development of new regulatory structures that might address financial innovations, particularly OTC derivatives, which were changing the nature of risktaking in financial markets and hiding risk rather than spreading it. This regulatory architecture also did not take sufficient account of the ways in which inadequate, erroneous or nonexistent private market discipline could trigger systemic network failures that could have broad reaching financial market and economic consequences.

This passage of the CFMA thus led to a regulatory architecture that permitted innovations that were beneficial to financial market actors, but potentially costly to society as a result of financial industry institutional structures that did not adequately assess or plan with respect to risk. Warren Buffett, for example, has referred to derivatives as “financial weapons of mass destruction” that constitute “ticking time bombs, both for the parties that deal in them and the economic system.” Bill Gross, founder and chief investment officer of PIMCO, a fixed income management firm, has characterized the operation of OTC derivatives as “a shadow banking system” because it has lain hidden for years, untouched by regulation, yet free to magically and mystically create and then package subprime loans into a host of three-letter conduits that only Wall Street wizards could explain.

The CFMA was not the only move in the direction of deregulation of the financial services industry. The Gramm-Leach-Bliley Act of 1999 (GLB) repealed portions of Glass-Steagall, which had prohibited bank holding companies from offering investment, commercial banking and insurance services. As was the case before the Great Depression, after GLB, single holding companies could offer banking, securities, and insurance. Although some blame GLB for the credit crisis, the repeal of Glass-Steagall likely only acknowledged the commercial reality of the erosion of Glass-Steagall on many fronts. Further, credit crisis fallout has not been concentrated in segments liberalized by Glass-Steagall. However, the repeal of Glass-Steagall had important indirect consequences that contributed to an overall culture of risktaking that

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462 Stiglitz, supra note 51 (“As we stripped back the old regulations, we did nothing to address the new challenges posed by 21st-century markets. The most important challenge was that posed by derivatives.”); Michael Spence, *Agenda for the Next Few Months, in What G20 Leaders Must Do To Stabilise Our Economy and Fix The Financial System* 11, 13 (Barry Eichengreen & Richard Baldwin, eds. 2008) (noting risk shifting prior to the credit crisis that hid risk rather than spread it).
466 *TREASURY BLUEPRINT*, supra note 35, at 34 (noting that four sections of the Banking Act of 1933, which were known as the Glass-Steagall Act, “mandated strict separation of commercial and investment banking”).
467 Barth, Brumbaugh & Wilcox, supra note 232, at 1.
468 Id.
significantly contributed to the credit crisis.\textsuperscript{471} Regulatory actions may also have contributed to this culture of risktaking. The SEC, for example, adopted Regulation AB in 2005, which simplified ABS issuance and some assert reduced due diligence and disclosure requirements.\textsuperscript{472}

The CFMA is a better candidate for blame with respect to the credit crisis than is GLB. Uses of derivatives, particularly when combined with significant amount of leverage, can increase financial market volatility and risk.\textsuperscript{473} The exemption of OTC derivatives from regulation under the CFMA was also implemented with insufficient analysis of the critical operation of derivatives as key elements of financial system networks. It is virtually impossible to regulate financial system network risk effectively without at least some knowledge of the activities and risk profile of varied participants in OTC derivatives transactions. Consequently, at a minimum, some regulation of OTC derivatives trading activity should be one outcome of the credit crisis.\textsuperscript{474} The risk that OTC derivatives may pose for financial market networks also reflects broader questions of transparency that are relevant not only with respect to derivatives, but in relation to financial market activities of a broad range of regulated and unregulated market actors.\textsuperscript{475}

III. TRADING SECRETS, TRANSPARENCY, AND MARKETS

A. OTC Derivatives, Transparency, and Disclosure

A key aspect of OTC derivatives’ risk comes from insufficient disclosure. Many acknowledge that transparency remains an important challenge in the OTC derivatives arena.\textsuperscript{476} Lack of transparency in of OTC derivatives positions can impede risk assessment. In addition, hedge funds, as well as other active users of OTC derivatives, may be secretive, in part to prevent others from trading against them.\textsuperscript{477} Trading positions and strategies are viewed by hedge funds as analogous to the Coca-Cola formula trade secret. In response to the 2008 SEC emergency order that would have required hedge funds to publicly disclose details concerning their short

\textsuperscript{471} Stiglitz, supra note 51 (“The most important consequence of the repeal of Glass-Steagall was indirect—it lay in the way repeal changed an entire culture. . . .When repeal of Glass-Steagall brought investment and commercial banks together, the investment-bank culture came out on top. There was a demand for the kind of high returns that could be obtained only through high leverage and big risktaking.”).


\textsuperscript{473} Schinasi et al., supra note 191, at 8 (noting concern about whether instabilities connected to OTC derivatives and modern finance could “give rise to systemic problems that potentially affect the international financial system.”).

\textsuperscript{474} David S. Ruder, Suggestions for Regulation of Hedge Funds Following the Financial Crisis of 2008, at ___.

\textsuperscript{475} Testimony Before the House Committee on Oversight and Government Reform, Nov. 13, 2008.

\textsuperscript{476} Chan et al., supra note 34, at 236 (describing hedge fund risk as neither widely appreciated nor well understood).


\textsuperscript{478} SEC, Implications of the Growth of Hedge Funds, at 49-50, Sept. 2003, Staff Report to the United States Securities and Exchange Commission (“Many hedge funds, however, decline to share specific position transparency citing, among other reasons, the need to keep such proprietary information confidential.”); Steven M. Sears, The Hidden Options Giant, BARRON’S, June 4, 2007 (noting that OTC options trading activities are often secret but nonetheless influential in futures, options, and stock markets).
positions, many hedge fund managers and their lobbyists attacked the order “saying it amounted to making the Coca-Cola Company disclose its top-secret formula.” Assertions of secrecy with respect to trading should not be accepted uncritically. Further, secrecy itself can have implications for risk assessment processes and may even hamper accurate evaluation of potential risks.

1. Disclosure, Contagion, and Regulatory Enforcement

Hedge fund secrets are not quite like the Coca-Cola formula trade secret, particularly if one accepts an analogy between financial contagion and diseases that pose a public health risk. One potential difference between secret trading positions and secret drink formulas relates to the potential for negative externalities. Trading positions based on mistaken interpretations of current or future market conditions can lead to systemic network failures that can deleteriously affect large numbers of people, many of whom may have absolutely no connection to the transaction gone awry. An analogous situation with the Coca-Cola formula might be one in which Coca-Cola, by virtue of its chemical composition, causes large numbers of people to become ill. It would likely be difficult for Coca-Cola to keep its formula secret from doctors who are treating patients made ill by the Coca-Cola formula, which is a decidedly different question than whether the formula should be made available to the public. Although market crisis is not the same as illness, bad market bets can cause financial contagion that is analogous to contagion caused by a disease or food-borne illness. This similarity provides a basis for requiring disclosure by market participants, at least at the wholesale level, even for those participants not otherwise subject to regulatory registration or disclosure requirements.

Secrecy has potentially significant market ramifications, particularly because market secrets are evident in other areas of the financial services industry. Secrecy may increase information asymmetry and information costs, which is one rationale for mandatory disclosure frameworks. In assessing secrecy in relation to trading activities of both regulated and unregulated market participants, one cannot only consider the commercial benefit of secrecy to a market participant in determining whether secrets should be protected from even wholesale disclosure, but must also take into account potential public benefits from disclosure

479 See infra notes ___ to ___ and accompanying text.
480 Hui Huang, Risk Aversion, Mandatory Disclosure and the Concealment of Information, 99 ECON. LETTERS 2 (2007) (noting the general belief that hat public disclosure of insider trading reduces information asymmetry and increases price efficiency and market liquidity, but finding in empirical study that the market impact of disclosure in cases of risk averse insiders may vary depending on the number of trading rounds).
and costs of nondisclosure.

2. Secrecy, Regulation, and Risk Assessment: Investor Protection and Wholesale Disclosure

Since their inception, U.S. federal securities regulation frameworks have distinguished between private and public entities. Securities registration and disclosure requirements typically do not apply to private entities, in large part because the investors in such entities are thought to be able to fend for themselves without the benefit of the registration and disclosure requirements that form the core of securities law requirements for registered entities.\(^{482}\) In contrast, issuers of securities in public offerings are subject to registration and extensive and detailed entity and transactional disclosure requirements.\(^{483}\) The public-private distinction is thus largely based on assumptions about the nature of investors in each type of entity, which reflects one of the SEC’s primary goals of protecting investors.\(^{484}\)

At the same time, however, the public-private distinction is primarily focused on the retail investor and does not adequately take account of the role that private market participants now play in public markets. Given that hedge funds are a potential source of systemic risk, constitute a significant proportion of secondary market trading activity, and can potentially move markets, the public-private distinction has less resonance. This distinction needs to be reconsidered in light of the implications of entities’ activities for questions of network risk and thus both investor protection and market integrity, which is a second concurrent goal of securities laws. Investor losses in the credit crisis have been massive.\(^{485}\) The magnitude of such losses and potential systemic risk emerging from activities of both regulated and unregulated and public and private entities underscore the need for regulatory frameworks that comprehensively address systemic risk as a core aspect of both investor protection and market integrity and stability.

The credit crisis illustrates how systemic risk regulation should be a core aspect of investor protection. The need for systemic risk oversight as a method of investor protection arises from the nature of trading activities in financial markets. The sheer number of trades that market participants may make creates a level of complexity in financial markets that challenges the ability of both firms and regulators to regulate risk. Mandatory disclosure requirements are geared to the average retail investor. Networked financial markets underscore the need for disclosure at the wholesale level to regulators or trusted third parties given the task of monitoring

\(^{482}\) SEC v. Ralston-Purina Co., 346 U.S. 119, 125 (1953) (establishing that the main consideration in determining availability of Section 4(2) private offering exemption is whether offerees are able to fend for themselves without need of the protection afforded by the Securities Act).


\(^{484}\) Transactions by an Issuer Deemed Not to Involve Any Public Offering, 38 Fed. Reg. 28951, 28952 (Oct. 18, 1973) (to be codified at 17 C.F.R. pts. 230, 239) (“Congress in enacting the Federal securities laws, created a continuous disclosure system designed to protect investors and assure the maintenance of fair and honest securities markets.”).

system risk and stability. Such wholesale disclosure should enable regulators to have more knowledge about risks to financial markets posed by market participants and varied market activities, regardless of whether the participants are themselves subject to disclosure or registration requirements with respect to retail investors. Such wholesale disclosure can enhance understanding of system risk and potentially help avoid future market crises.

The need for wholesale disclosure all the more urgent because secrecy has become paradoxically perhaps even more pervasive in today’s era of information overload. Further, secrecy has broader implications and may have bearing on decision making processes for those maintaining secrets.\textsuperscript{486} In addition to potentially “debilitating judgment,” when secrecy “shuts out criticism and feedback,” it can lead people to become “mired down in stereotyped, unexamined, often erroneous beliefs and ways of thinking,” which may mean that neither perceptions of a problem nor reasoning about the problem, “receives the benefit of challenge and exposure.”\textsuperscript{487} Secrecy can thus contribute to a lack of rigorous consideration of risk, in part because cognitive diversity “is essential to good decision making,”\textsuperscript{488} and may help explain some aspects of the widespread risk management failures in the credit crisis.\textsuperscript{489} Two notable areas in which secrecy is prominent are documentation of OTC derivatives transactions and dark pools of liquidity.

B. Contract Secrets: ISDA Agreements and OTC Derivatives

Private legal rules, often specified in form documents, are typically incorporated into OTC derivatives contracts.\textsuperscript{490} ISDA, the International Swap and Derivatives Association, is a global trade organization that represents most OTC derivatives industry participants.\textsuperscript{491} The ISDA Master Agreement was created in 1987 and last amended in 2002.\textsuperscript{492} ISDA agreements have enabled the culture of speculative trading that became so prominent prior to the credit crisis.\textsuperscript{493} More than 90% of OTC derivatives transactions globally are documented using ISDA Master Agreements.\textsuperscript{494} The ISDA Master Agreement establishes the principal credit and legal terms between parties to the OTC derivatives transaction and is typically signed without modifications.\textsuperscript{495} Although key provisions of ISDA Master Agreements may not be heavily negotiated,\textsuperscript{496} the 10 to 20 page “Schedule” to the ISDA Master Agreement sets forth all

\textsuperscript{486} SI\textsc{S}ES\textsc{SA} BA\textsc{K}, SECRETS: ON THE ETHICS OF CONCEALMENT AND REVELATION (1984).
\textsuperscript{487} \textit{id.} at 25.
\textsuperscript{488} JAMES SUROWIECKI, THE WISDOM OF CROWDS 38 (1999).
\textsuperscript{489} Confessions, \textit{supra} note 101.
\textsuperscript{490} Partnoy, \textit{supra} note 188, at 216.
\textsuperscript{491} \textit{id.} at 217.
\textsuperscript{492} \textit{id.} (describing the ISDA agreement as the “central document used by most derivatives market participants”).
\textsuperscript{493} \textsc{l}i\textsc{P}UMA & LEE, \textit{supra} note 130, at 43 (noting that contract relationships in derivatives embed a culture of speculation).
\textsuperscript{496} Partnoy, \textit{supra} note 188, at 221.
modifications, elections, and negotiated provisions.\textsuperscript{497} In the case of a hedge fund, negotiation would typically be with a derivatives dealer and would focus on events upon which the counterparty could terminate open transactions or liquidate hedge fund collateral held under the ISDA Master Agreement.\textsuperscript{498} Parties typically enter into derivatives transactions after execution of the master agreement.\textsuperscript{499} Transactions may be entered into orally and later followed by a confirmation reflecting the terms of the specific transaction.\textsuperscript{500}

ISDA Master Agreements represent a private body of legal rules that applies to the vast majority of OTC derivatives transactions.\textsuperscript{501} Decision making power within ISDA rests in the hands of a small group of major derivatives dealers.\textsuperscript{502} End users, a larger and more diffuse group, have no vote in ISDA decisions and legal rules.\textsuperscript{503} OTC derivatives transactions thus in many instances constitute secret transactions subject to private legal rules generated by parties that dominate the market for OTC derivatives. ISDA also plays a role in shaping interpretation of legal rules by filing amicus briefs in court cases involving interpretations of ISDA agreements, pushing for modification of laws to accommodate provisions in ISDA documents, and lobbying for continued nonregulation of OTC derivatives transactions.\textsuperscript{504} ISDA agreements represent a continued use of nonpublic transaction mechanisms to handle transactions that may have great significance to the public.\textsuperscript{505} The generation and uses of ISDA agreements and legal rules contribute to an overall lack of transparency in the OTC derivatives arena.

C. \textit{Secret Trades and Hidden Prices: The Move from Exchanges to Dark Pools}

In addition to secretive transactions, private contracts, and a body of largely private law, secrecy is also increasingly utilized in the actual trading of financial instruments. As a result, transactions that formerly traded on public exchanges have increasingly been shifted to secret transaction platforms. Single broker-dealers, consortiums of broker-dealers, or independent

\textsuperscript{497} Koya, \textit{supra} note 495.  
\textsuperscript{498} \textit{Id.}  
\textsuperscript{499} Partnoy, \textit{supra} note 188, at 217-18.  
\textsuperscript{500} \textit{Id.}  
\textsuperscript{501} \textit{Id.} at 221 (noting that ISDA is the sole provider of legal rules for derivatives transactions)  
\textsuperscript{502} \textit{Id.}  
\textsuperscript{503} \textit{Id.}  
\textsuperscript{504} Annelise Riles, \textit{The Anti-Network: Private Global Governance, Legal Knowledge, and the Legitimacy of the State}, 56 AM. J. COMP. L. 605, 615 (2008) (describing how ISDA in jurisdictions all over the world ensures that ISDA agreements are declared enforceable and lobbies to change national laws to conform with ISDA documentation); \textit{PARTNOY, supra} note 415, at 141, 148-152 (noting that ISDA “had persuaded lawmakers to allow the unregulated derivatives market to grow unchecked since 1985.”); \textit{ISDA Responds to SEC Call for CDS Regulation}, CreditFlux.com, Sept. 23, 2008, http://www.creditflux.com/digest/2008/09/23/isda+responds+to+sec+call+for+cds+regulation.htm (quoting ISDA executive director and chief executive officer as responding to SEC Chairman Cox’s call for regulation of CDS markets by stating “'[h]owever, proposals which would seek to treat privately negotiated contracts as securities, or otherwise apply ill-fitting regulatory regimes to these agreements, are likely to deter healthy economic activity and push derivatives into markets where the SEC has no jurisdiction.’”).

\textsuperscript{505} Partnoy, \textit{supra} note 188, at 217 (noting that legal scholars have not focused much on ISDA agreements as a source of legal rules).
entities may operate these so-called “dark pools of liquidity.” Dark pools are platforms that facilitate executions of orders or indications of interest without public display of such orders or the prices at which such orders are executed. Dark pools reflect the influence of technologies that have eliminated the need for trading floors or platforms at organized exchanges. Instead, former customers of exchanges are now steering transactions to their internal systems. For example, companies such as UBS, Goldman Sachs, and Credit Suisse direct as much as 12 percent of U.S. stock trades away from the exchanges to their own internal systems. In 2006, securities firms “internalized” 16 percent of all trades in NYSE-listed stocks, an increase from 13.2 percent in 2005 and 11.5 percent in 2004. Dark pools reflect the development of alternative trading systems (ATSs), which include crossing networks that may break larger orders into smaller sizes and match order execution without routing them to an exchange or market center. Growth of dark pools may be a reaction to SEC’s Regulation NMS, which has made it more difficult for institutional investors to trade large blocks of stock effectively. Dark pools thus alleviate execution problems with large orders “in a fragmented market by providing access to undisplayed, off-exchange liquidity.”

Dark pools are attractive to large traders because they are anonymous: “[t]hat is why money managers who do not want to expose their strategies are sending more trades to so-called dark pools, the internal or private networks where prices are secret.” Dark pools may also provide an easier platform for trading less liquid small- and mid-cap stocks. Dark pools are also attractive because they lower costs to significant traders by enabling them to get paid for the trades they make instead of having to pay exchanges for such transactions. In addition to lower trading fees, dark pools may offer faster processing speed.

Dark pools thus offer significant benefit to those able to take advantage of them. These benefits to dark pool traders may, however, significantly influence all investors, particularly if dark pools continue to grow in magnitude. Dark pools lack transparency, which is increasingly important in a world of highly complex financial market products, trading strategies, and networks.

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506 LEHMAN BROTHERS, DARK POOL LIQUIDITY OVERVIEW 2, Dec. 2007.
508 Ortega & Onaran, supra note 507.
510 Regulation NMS, Exchange Act No. 34-51808 (June 9, 2005), http://www.sec.gov/rules/final/34-51808.pdf (requiring trading centers to enact and enforce policies to prevent execution of trades at prices lower than quoted prices at other exchanges, ensure fair and non-discriminatory access to quotations, and prohibiting market participants from pricing in increments smaller than a penny).
511 Erik R. Sirri, Keynote Speech at the SIFMA 2008 Dark Pools Symposium; Lehman Brothers, supra note 506, at 2.
512 Lehman Brothers, supra note 506, at 2.
513 Ortega & Onaran, supra note 507.
514 Bogoslaw, supra note 509.
515 Id.
516 Sirri, supra note 511.
efficiency. Dark pools do not publish quotes or price information. To the extent that large amounts of trades are executed on platforms for which the prices are neither known nor reported, the market may become less transparent, and liquidity risk may be higher as a result of greater uncertainty about true market prices. The lack of publicly available prices “can have a negative impact on price discovery across the entire market, since the fragmentation of the market brought about by networks across which prices are not communicated makes it difficult to establish precisely what the market price is.”

Dark pools may also provide opportunities for self-dealing or price manipulation by the financial institutions that run them.

Dark pools represent another type of regulatory arbitrage, where market activities converge around less regulated arenas. Estimates suggest that algorithmic trading, which like dark pools permits traders to manage their trade executions by disguising orders, will account for more than 50% of all trading in the U.S. by 2010. Dark pools represent yet another financial innovation that has benefits but potentially significant costs that must eventually be taken into consideration from a regulatory perspective. Although the existence of dark pools may not be problematic at present, regulatory reactions to the credit crisis should assess the implications of the lack of transparency in dark pools for network risk and the effective operation of markets, not only for traders executing trades through dark pools, but the broader range of market participants as a whole. Dark pools thus draw attention to the need for a more comprehensive regulatory focus on trading activities. Distinguishing between potentially positive and negative consequences of trading activities requires better internal and external risk management by both industry participants and regulators in dark pools and elsewhere.

IV. TRADING AND RISK: REGULATORS, INDUSTRY AND NETWORK MANAGEMENT

The credit crisis will no doubt trigger a plethora of proposals for greater regulation of the financial services industry in the U.S. and elsewhere. In the U.S., such efforts have significant potential to reflect a repetition of the crisis-reaction paradigm that has been characteristic of much U.S. financial market regulation. However, efforts that merely seek to impose more regulation should be resisted. Myriad and multiple layers of existing regulations did not avert the current crisis. Adding yet more layers is unlikely to be an improvement. Securities markets have long existed in the shadow of either self-regulation or government regulation. In the aftermath of the credit market crisis, however, significant attention should be paid to how and why existing regulatory frameworks failed to avert the current crisis. The credit market crisis reflects a combined failure of both industry participants and their regulators. The lessons learned from scrutiny of the role of inappropriate or ineffective regulation and regulators should be used to determine the future shape of financial market regulatory architecture, particularly with respect to system stability. The Treasury Blueprint proposed by the Treasury Department in early 2008 recommended significant reform in financial market regulation and thus makes a

521 Ortega & Onaran, supra note 507.
522 Barry Eichengreen & Richard Baldwin, Introduction, in WHAT G20 LEADERS MUST DO TO STABILISE OUR ECONOMY AND FIX THE FINANCIAL SYSTEM 1, 1 (Barry Eichengreen & Richard Baldwin, eds. 2008) (“Everyone agrees on the need to strengthen supervision and regulation, but there is no agreement on how to go about this.”).
good starting point from which to begin discussion of post-credit crisis U.S. regulatory reforms.\footnote{Treasury Blueprint, supra note 35.}

Assessment of past regulatory failures may enable the adoption of better regulation that is both flexible and effective, as opposed to simply more regulation. Regulatory approaches should also consider to a greater extent the implications of market activities and trading practices for systemic risk, with a focus on creating regulatory structures that promote creation of incentives for individual market participants to better manage risk, which is a core aspect of effective private market discipline. Regulatory structures should enable regulators to monitor the extent to which the activities of market participants reflect appropriate treatment of risk. Such structures should provide mechanisms though which the performance of regulators might also be effectively monitored and evaluated, including with respect to whether industry capture exists in a particularly regulatory arena. New regulatory structures would need to be global in scope, both through cooperation among national regulators, as well as the creation of global institutional structures where appropriate.\footnote{Martin Wolf, Why Agreeing to a New Bretton Woods is Vital, FIN. TIMES, Nov. 4, 2008 (discussing proposal to create a new Bretton Woods system that includes new global institutions for finance).} New regulatory structures should reflect recognition that no “magic bullet” exists that will address the regulatory and industry failings that led to the credit crisis. Rather, new regulations must create a regulatory architecture that is flexible and able to respond in different ways to varied sources of potential risk in financial markets. As is the case in the computer context, network risk in the financial market context may be amenable to being reduced in a variety of ways.\footnote{Bill Hancock, Assessing and Reducing Network Risk, NETWORK SECURITY (Feb. 1995) (noting that network risk in the computer context can be reduced in a variety of ways).} New regulatory approaches will require that Congress significantly modify existing laws and regulatory structures. It will also require significant changes in risk assessment and management by both regulators and industry participants.

A. The Failure of SEC Risk Regulation: The Demise of the CSE Regime

The credit crisis has unfolded in an environment with a multitude of regulatory requirements from varied regulators and various regulatory frameworks, including regulation of global investment banks by the SEC under its voluntary Consolidated Supervised Entities (CSE) framework. This now suspended program was adopted by the SEC in 2004 to provide consolidated SEC supervision of investment bank holding companies and was intended to be consistent with Federal Reserve oversight of Bank Holding Companies.\footnote{SEC, Consolidated Supervision of Broker-Dealer Holding Companies: Program Overview and Assessment Criteria, April 16, 2007, http://www.sec.gov/divisions/marketreg/cseoverview.htm.} Under the CSE program, which was intended to capture a segment of financial market participants that fell in a post-Gramm-Leach-Bliley Act regulatory gap,\footnote{Christopher Cox, Testimony Concerning Turmoil in U.S. Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, Sept. 23, 2008, Committee on Banking, House, and Urban Affairs, U.S. Senate (noting that the Gramm-Leach-Bliley Act failed to give regulatory authority over investment bank holding companies to any agency and characterizing this failure as a costly mistake); Erik R. Sirri, Testimony Concerning Oversight of Risk Management at Investment Banks, at 5-6, Subcommittee on

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affiliates could choose to be subject to group-wide SEC supervision. The CSE permitted the SEC to monitor risk and respond to operational weaknesses in CSE holding companies and their unregulated affiliates that might negatively affect regulated entities such as banks and broker-dealers or pose broader systemic risks.

Under the CSE program, the holding company was required to measure group-wide capital adequacy in accordance with the Basel II Accord, which has created international standards for determining financial industry capital requirements, and provide the SEC with information concerning credit and risk exposures and analysis of liquidity risk. Broker-dealers could become CSEs by applying for an exemption from standard net capital rules with the broker-dealer’s ultimate holding company consenting to group-wide SEC supervision (in the case of holding companies that did not already have a principal regulator). The CSE program was voluntary, and CSE participants consented to SEC examination of books and records of the ultimate holding company and unregulated affiliates. Participants were required to report on holding company financial and operational condition and make available regulatory examination reports of entities in the group that were not subject to SEC examination. The participating firms agreed to consolidated supervision because of applicable international requirements and the preferential capital treatment they received under alternative methods of calculating net capital adequacy. The CSE program was intended to enable firms with “strong internal risk management” to use alternative methods to calculate net capital adequacy and involved use of the same mathematical methods for managing business risk and calculating net determinate regulatory capital requirements.

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529 SEC, supra note 526.
531 SEC, SEC Holding Company Supervision Program Description, June 5, 2008, http://www.sec.gov/divisions/marketreg/hcsupervision.htm; 17 C.F.R. 240.15c3-1, Appendix E (permitting alternative method for computing capital); Lehman Brothers, supra note 393, at 13 (discussing Lehman compliance with the SEC CSE rule and Lehman’s being subject to minimum capital requirements under Basel II).
532 SEC, supra note 526.
535 Id. (noting that the CSE program was “fundamentally flawed” because “investment banks could opt in or out of supervision voluntarily); Lehman Brothers, supra note 393, at 13 (discussing Lehman’s use of an alternative method...
SEC’s traditional net capital rule. Given that industry risk models have proven incorrect, capital computations based on these same risk models have also, not surprisingly, been inadequate in the face of the credit crisis.

The CSE program was not effective in meeting its stated goals of monitoring risk and operational weaknesses. Further, CSE program participating firms included the investment banks that have been focal points in the credit crisis. Two reports by the SEC Inspector General outline failings in SEC regulatory oversight under its CSE and Broker-Dealer Risk Assessment program. Although the report released by the SEC was heavily censored, with deletion of more than 136 references, Senator Grassley has made a full version of the CSE report available on the Internet. The Inspector General’s reports reveal some level of inattention to questions of systemic risk at the SEC. The Inspector General cites a number of other failures in issues relating to risk and describes enforcement failings with respect to rules that require retention of information about risk management policies, financial data, securities and commodities position data, trading records, and information concerning certain associated entities. The Inspector General also reveals inter-SEC coordination problems and suggests a need for better collaboration between the Division of Corporate Finance, whose staff reviews company filings such as Form 10-Ks, and the Division of Trading and Markets, which regulates the largest broker-dealers and their associated holding companies and which through its Office of Compliance, Inspection and Examination (OCIE) had oversight responsibilities in the CSE program. The failures outlined by the SEC Inspector General underscore continuing regulatory inattention to the implications of pervasive cultures of trading in highly networked financial markets and the implications of cultures of trading for risk.

Broad reaching financial market networks, combined with pervasive use of OTC derivatives as

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536 Coffee, supra note 472 (noting more relaxed capital requirements under the alternative calculation).
537 Charles Prince, Testimony Before the Committee on Oversight and Government Reform, at 4, March 7, 2008, U.S. House of Representatives (“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.”).
540 SEC Inspector General Report A, supra note 101, at 10-17 (questioning whether CSE ratio and liquidity requirements were adequate, noting that Bear Stearns was compliant with and actually had attempted to undertake a more realistic approach to liquidity by securing committed secured credit lines in excess of regulatory requirements).
541 Id. at 17-27, 30-34 (discussing SEC failure to address Bear Stearns’s high concentration of mortgage securities, and inadequate risk model review process and risk management staffing); SEC Inspector General Report B, supra note 538, at 12-14.

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essential links in such networks, necessitate reevaluation of risk in financial markets. Considerations of risk must take into account a bottom-up assessment of how trading practices shape financial market networks and the implications of such practices for systemic risk. This means that considerations of systemic risk that in the past were primarily issues of concern for banking regulators have now become relevant to a broad range of regulated and unregulated entities whose trading activities could spark a broader financial network system failure. Regulatory failures in the credit crisis have been widespread and are certainly not limited to the SEC. At the same time, however, the entities for which the SEC had oversight responsibilities under the voluntary CSE program have been one key epicenter in the current crisis.

B. Regulatory Principles and Financial Firewalls

1. Regulating the Regulators: Establishing Regulatory Principles and Regulatory Goals

The credit crisis has revealed important regulatory failures, particularly in the area of risk management. Any financial market regulatory reform must thus include specific mechanisms to enable better continuing evaluation of the performance of regulators. Establishment of specific regulatory principles that guide regulatory oversight could facilitate better evaluation of regulatory performance. These principles should include regulatory effectiveness and efficiency, regulatory responsiveness and flexibility, regulatory transparency and simplification, and regulatory neutrality. Identifying fundamental principles upon which regulation should be based can help in both determining what regulations should be enacted, but also in making continuing decisions about which regulations should be changed and which merit elimination. The need for fundamental principles is particularly acute in the U.S. given the existing tendency toward regulation by agglomeration, resulting in a jumbled mass of regulation that is outdated and at times the outcome of significant public choice dynamics. This method of construction has created a fragmented architecture that fails to include sufficient mechanisms for dealing with issues of systemic risk. Although the response of U.S. regulators to the current crisis has been timely and aggressive in many instances, the emergence of the crisis in the first place underscores the inadequacy of current regulatory frameworks with respect to questions of systemic stability and risk.

Efficiency and effectiveness, which draw attention to the costs and benefits of regulation, should be core regulatory goals that should be continually evaluated. The reality of competitive global

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543 George G. Kaufman, Bank Failures, Systemic Risk, and Bank Regulation, 16 CATO J. (1996) (“Bank (depository institutions) failures are widely perceived to have greater adverse effects on the economy and thus are considered more important than the failure of other types of business firms . . . As a result, bank failures have been and continue to be a major public policy concern in all countries and a major reason that banks are regulated more rigorously than other firms.”) (citations omitted); SEC Inspector General Report A, supra note 101, at 46-47 (noting that certain unregulated firms may pose systemic risk).

544 TreaSUry BLUEPRINT, supra note 35, at 4, 27 (noting that the U.S. system of functional regulation is largely incompatible with capital market developments).

545 G30, supra note 27, at 49 (“On the other hand, notwithstanding its somewhat dated and complex regulatory structure, U.S. regulators have been viewed by some as responding in a timely and aggressive manner to recent conditions.”).
financial markets requires that the effectiveness and efficiency of U.S. regulators be assessed in comparative perspective. An approach that emphasizes regulatory efficiency would eschew regulations whose benefits are less than their costs. Determinations of such costs and benefits should be an ongoing task that involves elimination of inefficient or ineffective regulators and regulation based on cogent, objective, and verifiable grounds. Assessment of regulatory effectiveness requires development of better metrics of regulatory performance, including data about regulatory processes and outcomes. Establishing ways to measure and monitor regulatory effectiveness and efficiency should facilitate better regulatory processes.

Regulatory responsiveness measures how regulators respond to external events and changing business contexts. As the SEC exemplifies, U.S. regulators have been highly responsive to the credit crisis. In the SEC’s case, a lack of responsiveness during times other than crisis, particularly with respect to rulemaking, was criticized in the Treasury Blueprint. The seeming lack of a strong SEC response to the $50 billion Madoff Ponzi scheme over a period of years has also led to significant criticism of the SEC on effectiveness and responsiveness grounds and has led to Congressional hearings and an investigation by the SEC Inspector General.

The Madoff Ponzi scheme illustrates the importance of regulatory recognition and apprehension of trading and trading strategies. Harry Markopolos, a former Madoff competitor, tried for nine years to persuade the SEC to examine Madoff’s operation, which Markopolos believed based on Madoff’s stated returns could only be the result of either front running (a less likely alternative) or some type of Ponzi scheme (a highly likely alternative): “far better that the SEC is proactive in shutting own a Ponzi scheme [Madoff’s operation] rather than reactive.” Markopolos, a self-described derivatives expert, identified 29 red flags in Madoff’s operation and in 2005 submitted to the SEC a detailed 19-page memo with supporting documents concerning the Madoff Ponzi scheme. Markopolos reached his conclusion that Madoff was likely operating a Ponzi scheme based on a detailed analysis of Madoff’s returns, the potential range of trading strategies that were likely available Madoff, Madoff’s asserted or likely trading strategies, Madoff’s refusal to permit due diligence of his operations, and the beliefs of identified financial market participants who would not do business with Madoff.

Other traders have stated that Madoff’s strategy, although valid, would not have been possible with the amount of money Madoff managed, noting that Madoff’s investing strategy “raised red flags that should have been

546 Treasury Blueprint, supra note 35, at 112-113 (discussing SEC delays in approving SRO rule changes).
548 Markopolos Memo to the SEC, at 1-2, dated Nov. 5, 2005; Gregory Zuckerman, Chasing Bernie Madoff, WALL ST. J., Dec. 18, 2008 (discussing Harry Markopolos, a former Madoff competitor who spent 9 years trying to persuade the SEC that Madoff was running a Ponzi scheme).
549 Markopolos Memo, supra note 548.
550 Id. at 4-13 (identifying 29 red flags that suggest that Madoff’s operations were a Ponzi scheme based on a detailed analysis of Madoff’s trading returns, available trading strategies, and beliefs of varied identified financial market participants).
obvious to the banks and investment firms that promoted Mr. Madoff.”551

Although the SEC Madoff Case Opening Memo notes that the SEC sought to ascertain whether Madoff was operating a Ponzi scheme,552 the SEC Division of Enforcement Case Closing Recommendation does not discuss any aspect of Markopolos’s detailed trading analysis. However, based on voluntary document production and testimony by Madoff, the SEC Case Closing Recommendation indicates that the “staff found no evidence of fraud” but did find that Madoff needed to register under the Advisers Act.553 The SEC does not appear to have penetrated the true nature of Madoff’s fundraising operations, despite the fact that Madoff made use of middlemen or “feeders,” including one former SEC attorney and enforcement division supervisor that was apparently interviewed by the SEC during its investigation of Madoff.554 The SEC notes that Madoff had misled the SEC examination staff and had “not fully disclosed to the examination staff either the nature of the trading conducted in the hedge fund accounts or the number of such accounts at [Madoff’s firm].”555 Despite Madoff’s deception, the SEC recommends: “closing this investigation because both [Madoff and his largest client] voluntarily remedied the uncovered violations, and because these violations were not so serious as to warrant an enforcement action.”556 Regulatory treatment of the Madoff case demonstrates that effective, efficient, and responsive financial market regulation requires greater industry expertise and better regulatory understanding of the significance of trading and trading strategies in financial markets and the ways in which particular trading activities may be suggestive of fraud or may pose a broader systemic risk.557

Regulatory flexibility, which is tied to regulatory responsiveness, evaluates the extent to which regulators show flexibility in responding to changing conditions. U.S. regulators have a mixed record in the flexibility category, with some instances of flexible responses and other areas where less flexibility has been apparent, particularly with respect to the implications of financial networks and the changing sources of systemic risk. The complexity and pace of innovation of financial markets necessitates greater regulatory flexibility and a regulatory structure in which regulation is determined to a greater extent by the shape and needs of the market rather than preexisting regulatory structures that may not be consistent with financial market architecture.

Regulatory transparency requires public dissemination of relevant regulatory information and can bolster the credibility and accountability of regulators. Significant questions about regulatory accountability have accompanied the credit crisis, both with respect to the activities of

552 SEC Division of Enforcement, Case Opening Report, Case No.: NY-07563, Jan. 24, 2006.
553 SEC Division of Enforcement, Case Closing Recommendation, Case No.: NY-07563, Nov. 21, 2007.
554 Jeremy Strasburg, Madoff’s ‘Feeders’ Under Focus, WALL ST. J., Dec. 27, 2008 (discussing Madoff’s use of middlemen or feeders and describing the activities of 5 prominent Madoff feeders).
556 SEC Division of Enforcement, supra note 553.
557 Jeffrey Goldfarb & Martin Hutchinson, Rebuilding the SEC, N.Y. TIMES, Jan. 5, 2009 (discussing the deterioration of the SEC and noting that rebuilding the SEC will require greater industry expertise and political support).
regulators before and during the crisis, as well as uses of bailout funds. Transparency may also enhance regulatory coordination both within and among regulatory agencies. Transparency can enable those other than regulators to better understand the regulatory process and outcomes. Existing regulatory frameworks are somewhat transparent. Significant information is broadly available about regulatory outcomes. As continuing revelations about the SEC investigation of Madoff’s funds suggest, less is known about regulatory processes, which is of particular concern in the aftermath of the credit crisis. The SEC censoring of its Inspector General’s report on the CSE program is similarly of concern from a transparency perspective, as is the recent disclosure that the Office of Thrift Supervision (OTS) permitted a now failed bank to backdate a capital infusion. Such behaviors only add to significant questions that now exist about regulatory processes and transparency. Although regulatory processes may in some instances not be able to be made public, performance review of public and non-public regulatory actions should be a continuing aspect of management and evaluation of both regulators and regulatory frameworks.

The current U.S. architecture of multiple and at times overlapping regulators makes evaluation of regulatory processes difficult. Regulatory reform should focus where possible on implementing regulatory simplification and regulatory neutrality. Simplification is unlikely to be a panacea, but may help make regulatory frameworks and processes more transparent. Regulatory neutrality would help ensure outcomes for regulated entities do not depend on the identity of their regulator. The presence of multiple overlapping regulators encourages regulatory arbitrage and is regulator driven in that existing regulatory structures may be the most important determinants of regulatory treatment rather than the activities being regulated. A system based on specific principles is an important first step in creating regulatory frameworks that can better manage network risk. Fundamental defining regulatory principles, which are largely missing from the Treasury Blueprint, should also be important factors in ongoing evaluation of financial regulatory frameworks.

2. Risk Barriers: Creating Financial Firewalls

The burden of monitoring financial markets, however, cannot rest solely in the hands of regulators. Regulatory approaches in the future should attempt to regulate activities that might lead to network failures by facilitating the creation of firewalls around failing entities to limit the network effects of their failures. These financial firewalls would be analogous to computer

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559 See supra notes ___ to ___ and accompanying text.
560 Michael M. Phillips & Jessica Holzer, Regulator Let IndyMac Backdate Infusion, WALL ST. J., Dec. 23, 2008 (noting that OTS permitted IndyMac Bank to “alter its records so it appeared to be in better shape -- weeks before it was seized by the government,” which enabled the bank to avoid being required to ask the Federal Deposit Insurance Corp. for permission to accept brokered deposits).
561 Senator Barack Obama, Renewing the American Economy, at 7, March 27, 2008 (“Even the best government regulation cannot fully substitute for internal risk management.”).
firewalls or quarantines in disease epidemic contexts. A regulatory approach that seeks to create firewalls requires flexible and efficient regulatory frameworks that focus on oversight of the incentives within regulated firms such that firms internalize the risks of their operations. This necessitates an approach that incorporates understanding by both regulators and firms of the role of trading and other activities as potential sources of risk. In the aftermath of the credit crisis, regulators have attempted to some extent to focus on trading activities. In 2008, the SEC and other securities regulators around the world focused on one specific trading activity, short selling, as the culprit in recent market volatility and declines, and banned or significantly restricted short selling activities. The effectiveness of this short selling ban has been debated. SEC elimination of the uptick rule, which required that short sales of listed securities occur at “a price above their last different sales price,” has also been a subject of contention since the SEC abolished the rule in 2007. Debates about the short selling ban, securities lending, and uptick rule underscore the need for additional data about trading activities from a broad range of currently regulated and unregulated market actors. Acquisition of such data can help regulators and market participants better manage risks and create necessary firewalls.

C. A Twin Peaks Regulatory Blueprint: System Oversight for Systemic Risk

1. Financial Market Architecture: Structural Blueprint Options

Stated regulatory principles can provide a framework within which to build regulatory structures that meet typical financial market regulation policy goals. A recent Group of 30 (G30) report identifies four specific policy goals of financial market regulation: financial institution safety and soundness, mitigation of systemic risk, market fairness and efficiency, and investor and customer protection. The credit crisis reflects failures in U.S. regulatory frameworks in the first two goals of financial institution safety and soundness and mitigation of systemic risk. Regulatory architecture and regulatory and industry practices are key reasons for these failures. The fragmented U.S. regulatory system hinders system-wide regulation of financial networks and consequently systemic risk, which has significant bearing on the latter two goals of market fairness and efficiency and investor and consumer protection as well. At a minimum, risks that may affect and infect the financial market system as a whole or lead to financial contagion

562 Linda Briesemeister, Patrick Lincoln & Phillip Porras, Epidemic Profiles and Defense of Scale-Free Networks, WORM’03 67, 67 (Oct. 27, 2008) (discussing the ways to protect networks against infection from self-propagating viruses and worms).
563 CRMPG III, supra note 18, at 7 (discussing the need for private initiatives to complement official oversight and encourage industry wide mechanisms to help mitigate systemic risk).
566 Wachtell, Lipton, Rosen & Katz, It’s Time for the SEC to Constrain Abusive Short Selling, Client Memo, July 1, 2008.
568 AUSTRALIAN SECURITIES EXCHANGE, POSITION PAPER: TRANSPARENCY OF SHORT SELLING AND SECURITIES LENDING, Oct. 2, 2008 (discussing the ASX response to Australian short selling ban and push for greater transparency in short selling and securities lending transactions).
569 G30, supra note 27, at 21-22.
require system-wide regulation. Financial networks cut across industry sectors and pervade within and without financial market firms. Further, systemic risk may come in variety of shapes and sizes and may change significantly over time. Constructing a regulatory architecture that appropriately addresses and develops experience dealing with risks to the system is thus a key issue emerging in the wake of the credit crisis.

A variety of potential financial market regulatory blueprints exist, including four basic approaches: the Institutional, Functional, Integrated and Twin Peaks.\(^{570}\) The Institutional Approach uses a firm’s legal status to determine its regulator.\(^{571}\) In contrast, under a Functional Approach, the type of business transacted is the factor that determines regulatory oversight, without regard to legal status, which means that each separate business within a single firm might have its own functional regulator.\(^{572}\) The Integrated Approach uses a single universal regulator that addresses both safety and soundness oversight and conduct of business regulation for all financial services sectors.\(^{573}\) The Twin Peaks Approach used by Australia and the Netherlands, involves regulation by objective where the regulator performing the safety and soundness function is separate from the regulator that regulates business conduct.\(^{574}\)

The current U.S. regulatory system does not fall neatly within the above categories and has been described as an exception that represents a “prime example of the role that historical precedent, politics, and culture have played in the regulatory structure.”\(^{575}\) The complex U.S. financial market regulatory structure, which has come under increased scrutiny in recent years,\(^{576}\) includes both functional and institutional aspects with an added layer of complexity in the form of a number of agencies and actors at the state level.\(^{577}\) In many instances, the business conducted determines oversight—the SEC has regulatory oversight for broker-dealers, even those that are subsidiaries of banks subject to Federal Reserve oversight.\(^{578}\) The Federal Reserve and the Department of Treasury share responsibility for management of system stability.\(^{579}\) The fragmentation in U.S. financial services regulation has significant and negative consequences for the ability of regulators to manage risk: “[B]ecause our regulatory structure relies on having clear-cut boundaries between the ‘functional’ areas, industry changes that have caused those boundaries to blur have placed strains on the regulatory framework, and accountability for

\(^{570}\) G30, supra note 27, at 13.

\(^{571}\) Id. at 13, 14 (noting that China, Hong Kong and Mexico use an Institutional approach).

\(^{572}\) Id. at 13, 14 (noting that Brazil, France, Italy, and Spain are among the jurisdictions that use a Functional Approach).

\(^{573}\) Id. at 13, 14 (noting that the United Kingdom, Germany and Canada, Qatar, Singapore and Switzerland are examples of the Integrated Approach).

\(^{574}\) Id. at 13.

\(^{575}\) Id. at 14.

\(^{576}\) Id.

\(^{577}\) Id.; TREASURY BLUEPRINT, supra note 222, at 139 (characterizing the U.S. regulatory system as an institutionally based functional system).

\(^{578}\) GAO, supra note 214, at 9 (“[F]inancial products or activities in the U.S. 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.”).

\(^{579}\) Id. at 11.
addressing risks that cross boundaries is not clearly defined . . . making it more difficult for regulators to identify emerging threats to financial stability.”

2. The Australian Financial Market Blueprint

Because the traditional distinctions between different types of financial institutions have been reduced, the trading activities of individuals within a particular firm have in many instances become more important than the industry segment within which the firm is categorized. In recognition of these fundamental changes, the Twin Peaks regulatory model regulates by objective. Australia, which had a regulatory framework not unlike the U.S. with separate insurance, securities, banking, and competition regulators, reformed its financial system in the late 1990s to address the challenges of twenty-first century financial markets. The Australian financial system was reorganized with two dominant principles. The first ethos was one of regulatory simplification and efficiency. The second guiding force of Australia’s regulatory reform also emphasized regulatory efficiency and sought to impose regulation only where the “risk and consequences of market failure are sufficiently large.”

As a result of its reform process, Australia now has separate regulatory agencies that regulate systemic stability and prudential considerations related to information asymmetry. The Australia Prudential Regulatory Authority (ARPA) was created in 1998 as a safety and soundness regulator, in part to ameliorate the consequences of information asymmetries in financial markets, with a first objective being to ensure that financial institutions can meet their financial promises. The Reserve Bank of Australia (RBA), which formerly had prudential responsibility for banks and bank supervision responsibilities, became a regulatory authority that conducts monetary policy and manages system stability and the payments system. The bank supervision responsibilities of the RBA were transferred to ARPA, which uses a largely principles based framework. In addition to the RBA and ARPA, the Australia Securities and Investment Commission (ASIC) oversees conduct of business for financial services businesses, including venture capital and private equity firms. The Commonwealth Treasury, which coordinates with a number of agencies with respect to overall economic policy, has the power to direct ARPA on policy and operational issues.

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580 Id. at 34.
581 G30, supra note 27, at 19 (“The traditional demarcations among the products and services offered by banks, insurance companies, and securities firms have substantially blurred.”).
582 Id. at 14 (noting the growing interest in and support for the Twin Peaks approach of regulation by objective).
584 Id. at 5.
585 Id.
586 Id. at 6 (noting that ARPA supervises certain types of financial institutions from a “prudential” perspective); Australian Prudential Regulation Authority Act 1998, as amended (2008), http://www.austlii.edu.au/au/legis/cth/consol_act/apraa1998477.txt.
587 Goldsworthy, Lewis & Shuetrim, supra note 581, at 11-12.
588 Id. at 3-5.
589 G30, supra note 27, at 194.
590 Id. at 193 (discussing the role of ASIC).
591 Id. at 191.
3. The U.S. Optimal Blueprint

The Australian Twin Peaks model significantly influenced the U.S. Treasury Department Blueprint. The proposed long-term optimal Blueprint regulatory structure is a modified Twin Peaks structure that would include three primary federal regulatory functions related to market stability and risk management, prudential regulation, and conduct of business regulation. The Treasury Blueprint describes an optimal federal regulatory structure that includes three primary types of regulatory charters: a federal insured depository institution (“FIDI”) charter, which would consolidate national bank, federal savings association, and federal credit union charters, a federal insurance institution (“FII”) charter, and a federal financial services provider (“FFSP”) charter.

The FFSP charter would serve as a catch-all for firms that are not FIIIs or FIDIs, and FFSPs would include broker-dealers, hedge funds, private equity funds, venture capital funds, and mutual funds. FFSPs would need to comply with largely unspecified national standards with respect to financial capacity, expertise, and other requirements. The Treasury Blueprint would thus require some level of regulation of hedge funds and other entities that are currently lightly regulated.

The Treasury Blueprint structure would promote regulatory neutrality by ensuring that each regulatory objective is subject to oversight by a single regulator, in contrast to the current system where the same objective may be subject to oversight by different regulators functionally by industry. As is the case in the Netherlands and Australia where the central bank oversees market stability regulation, under the Treasury Blueprint, the Federal Reserve would have broad powers as the Market Stability Regulator. The Blueprint would give the Fed overall responsibility dealing with payment systems and systemic risk, which would enable U.S. regulatory structures to better track risks to the system that arise in networked financial markets. The Fed would have authority over all three types of federally chartered entities (FIDIs, FFIs, and FFSPs) and would continue its role as a lender of last resort. The prudential regulator (Prudential Financial Regulatory Authority or PFRA) would focus on financial institutions with some type of explicit government guarantee and would assume the current roles of the OCC and OTS. The Conduct of Business Regulatory Authority (CBRA) would monitor business

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592 TREASURY BLUEPRINT, supra note 35, at 13, 143 (“Treasury believes that an objectives-based regulatory approach would represent the optimal regulatory structure for the future. . . [t]he optimal objectives-based regulatory structure described below somewhat resembles the model adopted in Australia.”).  
593 Id. at 14-22.  
594 Id. at 14, 18.  
595 Id.  
596 Id. at 19-20, 103-05 (“The FFSP charter should be flexible enough to incorporate a wide range of financial services providers, such as broker-dealers, hedge funds, private equity funds, venture capital funds, and mutual funds . . . FFSP charter would result in the creation of appropriate national standards, in terms of financial capacity, expertise, and other requirements, that must be satisfied to enter the business of providing financial services.”).  
597 G30, supra note 27, at 189, 198 (noting that the De Nederlandsche Bank (DNB) is responsible for prudential and systemic supervision of all financial services in the Netherlands, and the Reserve Bank of Australia is responsible for system stability in Australia).  
599 TREASURY BLUEPRINT, supra note 35, at 15.  
600 Id. at 14.  
601 Id. at 17
conduct across all financial firms, including FIs, FIDIs, and FFSPs.\textsuperscript{602} PFRA and CBRA would be required to consult with the Federal Reserve prior to adopting or amending regulations that affect market stability (e.g., capital and chartering requirements), and the Federal Reserve would have the ability to participate in CBRA and PFRA examinations of federally chartered entities or initiate such examinations.\textsuperscript{603}

The CBRA mandate would encompass consumer protection issues relating to disclosure, business practices, and chartering and licensing.\textsuperscript{604} The Blueprint envisages the CBRA overseeing issues relating to disclosure, sales and marketing and anti-discrimination laws for FIDIs, disclosure issues relating to policy forms, unfair trade practices, and claims handling for FIs, and issues relating to operational ability, professional conduct, testing and training, fraud and manipulation, and duties to customers in the case of FFSPs.\textsuperscript{605} The CBRA model would incorporate the existing SRO model, while states would retain authority with respect to state-chartered entities.\textsuperscript{606} Under the Blueprint structure, current SEC functions would be split among different regulatory agencies. The Federal Reserve would be responsible for system stability oversight. The proposed corporate finance regulator would retain current SEC responsibilities with respect to corporate disclosures and governance, accounting oversight, and other similar issues,\textsuperscript{607} and the CBRA would assume SEC business conduct and regulatory enforcement responsibilities.\textsuperscript{608} The role of the corporate finance regulator in the Treasury Blueprint distinguishes the U.S. from other Twin Peaks models because transparency and market regulation is separated from the activities of the business conduct regulator.\textsuperscript{609}

The Treasury Blueprint gives the Federal Reserve wide powers to provide system-wide oversight of systemic risk.\textsuperscript{610} Moving in the direction of system-wide risk regulation of financial networks is a step in the right direction. Less clear is whether such power should be consolidated in a single entity that also operates as the monetary authority and lender of last resort. This is in part a question of system dynamics. As a document that is in part conceptual, the Treasury Blueprint is stronger at delineating new regulatory structures than it is at describing how such structures might become operational. In an ideal world, if the proposed structure were successfully implemented as contemplated by Treasury, the resulting structure would be a significant improvement over what exists at present, particularly with respect to questions of systemic risk. The proposed Blueprint structure, however, has numerous potential points at which it might fail. In the medium-term, even if the optimal structure is not adopted, the Blueprint contemplates evisceration of existing regulatory structures and entities, including, consolidation of the SEC and CFTC, substantial diminution of SEC regulatory authority, changes in SEC regulatory orientation, and consolidation of the OCC and OTS, among others, but gives little sense of

\textsuperscript{602} Id. at 19.  
\textsuperscript{603} Id. at 16.  
\textsuperscript{604} Id. at 19.  
\textsuperscript{605} Id. at 20.  
\textsuperscript{606} Id.  
\textsuperscript{607} Id. at 21, 138, 145.  
\textsuperscript{608} Id. at 21.  
\textsuperscript{609} G30, supra note 27, at 38.  
\textsuperscript{610} See infra notes ___ to ___ and accompanying text.
transition processes.\textsuperscript{611} The Blueprint does identify short, medium, and long-term goals for regulatory reform, but is unclear about significant details, particularly with respect to system dynamics that are likely to be determinative of Blueprint success.

The Treasury Blueprint would benefit from greater consideration of specific regulatory principles that can serve as a guiding force, means of continuing evaluation, and a basis for determining when modifications would be appropriate in the future. The medium term recommendations of the Blueprint include merger of existing regulatory agencies to harness greater efficiencies and have potential to meet one regulatory principle of regulatory efficiency. The streamlined regulatory bodies that would exist with implementation of the Blueprint could enhance efficiency by establishing clearer dividing lines than exist at present and reducing overlapping and duplicative regulatory structures. Merger of the CFTC and SEC may thus yield more efficient regulatory frameworks.\textsuperscript{612} As experiences with mergers in other arenas demonstrate, however, mergers can be difficult and cost-savings from mergers elusive.\textsuperscript{613} As a result, the extent to which the new regulatory framework would be efficient is not entirely clear.

The Blueprint structure would also involve creation of multiple new regulatory offices and functions, including the Mortgage Origination Commission, Office of National Insurance, Office of Insurance Oversight, Federal Insurance Guarantee Fund, Prudential Financial Regulatory Agency, Conduct of Business Regulatory Authority, Market Stability Regulator, and corporate finance regulator.\textsuperscript{614} These new regulatory functions and entities might in the end substantially diminish any efficiency gains made from the elimination of duplicative and overlapping regulatory bodies. Although the regulation by objective principle, if truly embraced by Congress, is likely to reduce duplicative regulatory structures, the actual processes by which old structures are modified and new ones implemented will be a crucial factor in the success of the Blueprint structure. The Blueprint does not discuss the dynamic aspects of the proposed reforms, even the short and medium term proposals, which makes the likelihood of implementation of any of the proposals difficult to assess, particularly given the political realities of financial market regulation in the U.S.\textsuperscript{615}

Also uncertain is the extent to which such mergers will yield regulatory structures that are effective. In the case of the SEC-CFTC merger, for example, the Treasury Blueprint recommends significant modification of current SEC regulatory approaches and the adoption of

\textsuperscript{611} Id. at 11-13, 146-56 (noting potential difficulties with the SEC-CFTC merger given the CFTC’s principles-based approach and recommending that the SEC modify its regulatory approach).

\textsuperscript{612} TREASURY BLUEPRINT, supra note 35, at 89, 106 (discussing merger of OTS and OCC and SEC and CFTC, noting with respect to the latter merger that “product and market participant convergence, market linkages, and globalization have rendered regulatory bifurcation of the futures and securities markets untenable, potentially harmful, and inefficient” and that a merger will help in creating “unified knowledge in the regulatory sector over risk concentration in these markets.”).

\textsuperscript{613} David Fubini, Colin Price & Maurizio Zollo, The Elusive Healthy Merger, in Mergers: Leadership, Performance, and Corporate Health 1, 1 (2006) (“Academic researchers and consultants have consistently shown that on average mergers and acquisitions deliver at best mediocre performance outcomes.”).

\textsuperscript{614} TREASURY BLUEPRINT, supra note 35, at 78-81, 128, 132, 138, 146-180.

\textsuperscript{615} John Shu, Treasury’s Blueprint: Regulatory Efficiency or More Red Tape, 9 ENGAGE 68, 70 (2008).
greater principles-based approaches using the CFTC as a model. Further, the division of SEC current responsibilities between the CBRA and the corporate finance regulator/SEC is both atypical as compared with other Twin Peaks models and fraught with potential for the same type of regulatory fragmentation that currently troubles U.S. financial market regulation. The Blueprint does not sufficiently assess the reasons why these change in regulatory structure and approach would result in more effective regulation in the securities context, which is likely to be a crucial factor fundamental to the success of the proposed merger. The degree of effectiveness of merged regulators will depend to a significant extent on operational questions of how the mergers and other regulatory changes are accomplished. Similarly, the flexibility and responsiveness of the Blueprint regulatory structure would depend on dynamic elements related to how the structure is implemented and how regulators actually operate within the new structures. The Treasury Blueprint proposal is stronger in its depiction of a regulatory regime that is neutral and likely less complex than current structures, but would benefit from greater attention to the dynamics of regulatory frameworks that may have a significant impact on regulatory effectiveness, efficiency, responsiveness, and flexibility. The Treasury Blueprint is, however, comprehensive in its understanding of the importance of system-wide management of systemic risk. The Blueprint view of systemic risk is based on an assumption that market discipline is the most effective tool to limit systemic risk, but does not discuss much how such discipline would actually unfold with respect to questions of systemic risk, which is a significant question in the aftermath of the credit crisis.

D. Mapping Networks and Network Risk: The Need for Better Financial Market Data

Under the Blueprint, the Federal Reserve’s role as risk regulator would enable it to gain access to information about the financial system more generally. The more immediate Blueprint recommendations would enable the Fed to have access to examination information from SEC and CFTC examinations. Under the optimal regulatory proposal, the Federal Reserve would have access to information about firms subject to PFRA (prudential regulator) and CBRA (conduct of business regulator) oversight. The Blueprint contemplates the Federal Reserve collecting information from all market participants. The nature of information collected by the Federal Reserve or other relevant regulators or third parties is an important element of network risk management.

The presence of financial networks necessitates better qualitative and quantitative understanding of financial network system dynamics, which should begin with consideration and collection of data about trading practices, incentives and risk for varied market participants, financial instruments, and trading strategies. The short selling ban reflects acknowledgment of the potential importance of trading activities in relation to market declines and even system risk. Even if effective, however, the short selling ban is no substitute for collection of comprehensive

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616 TREAUSURY BLUEPRINT, supra note 35, at 11-12.
617 TREAUSURY BLUEPRINT, supra note 35, at 148.
618 Id. at 15-16.
619 Id. at 85.
620 Id. at 148.
system-wide data about and assessment of trading activities. Collection of such data would lend additional transparency from a regulatory perspective to a broad range of trading practices and enable better assessment of the implications of such practices for financial market networks and systemic risk.

Discussions of the spread of viruses in the computer network context suggest that the nature of the network is a key question in determining vaccination strategies to address network infection. In the financial market context, mapping pervasive networks may be a critical tool in understanding and managing network risk. As the President’s Working Group 1999 report on OTC derivatives noted, access of regulators to information about the activities of unregulated affiliates of regulated entities “constituted a gap in the system of financial market oversight that should be filled by providing the relevant agencies with enhanced authority to obtain additional risk assessment information.” The credit crisis suggests that a similar gap may exist with respect to risk assessment information of even regulated entities. Oversight of the hedge fund industry and trading activities of a broad range of regulated market participants (including unregulated affiliates) will require the collection of significant data from both regulated and unregulated market players. Such wholesale data could be used in confidence by regulators or trusted third parties in connection with the identification, evaluation, and management of activities that may pose a systemic risk.

Networked relationships can mean that problems in one financial sector may spread to even seemingly unrelated sectors. The types of risks posed by financial system networks can be conceptualized as risks that may require disclosure at the wholesale level. Retail disclosure is unlikely to provide sufficient information about systemic risk, in large part because it largely reflects an assessment of risk on a company-by-company basis and is oriented toward the needs of the average retail investor. The complexity of financial market networks requires an understanding of aggregate risk that is best assembled through specific wholesale disclosure of trading activities of both regulated and unregulated entities. Assurances might need to be made concerning confidentiality of proprietary trading information for entities that submit information.

621 Justin Balthorp et al., Technological Networks and the Spread of Computer Viruses, 304 SCI. 527, 527 (Apr. 23, 2004).
622 Noshir S. Contractor, Daniel Zink & Michael Chan, IKNOW: A Tool to Assist and Study the Creation, Maintenance, and Dissolution of Knowledge Networks, in COMMUNITY COMPUTING AND SUPPORT SYSTEMS 201, 201-202, 205-206 (T. Ishida ed. 1998) (noting that advances in the twenty-first century will be based on knowledge networks and that knowledge networks may co-evolve with technology infrastructures).
623 PWG, supra note 455, at 35.
624 Tamar Frankel, Testimony Before the Committee on Financial Services, U.S. House of Representatives, at 8, Jan. 5, 2008 (noting that regulators lack market information).
626 Getmansky, Lo & Mei, supra note 367, at 30-31 (citing the type of data exchange between U.S. banks and the Comptroller of the Currency and associated with the NTSB investigations of airplane crashes as a model for data exchange in the securities regulation context, particularly with respect to the hedge fund industry).
The activities of hedge funds exemplify the need for additional market intelligence about trading activities. As economists Khandani and Lo note, hedge funds, in part by virtue of the liquidity and credit they receive through their prime broker relationships, have become “significant providers of liquidity and credit” and “impose externalities on the economy that are no longer negligible,” which has led to “hedge funds...becoming more like banks.” As a consequence, as is the case with banks, hedge funds and other market participants whose trading activities may not be regulated constitute sectors of activities in which failure “could have disastrous consequences for the viability of the financial system if it occurs at the wrong time and in the wrong sector.”

Requiring some level of wholesale risk disclosure for all market participants, regulated and unregulated, can bolster the private market discipline that remains the dominant ethos of U.S. securities regulation by focusing both industry participants and regulators on sources of risk and enabling them to assess and address risk in a dynamic, comprehensive, and cogent fashion.

Khandani and Lo suggest that regulators should collect the following information from hedge funds: monthly returns, leverage, assets under management, fees, instruments traded, and all brokerage, financing, and credit relationships. In addition, Khandani and Lo recommend that regulators or designated entities should collect similar information from prime brokers, banks, and other hedge-fund counterparties, as well as information about the capital adequacy of these financial institutions. Specific party and transactional data should be required from all market participants above a certain threshold, in both traditional exchanges, which already provide significant amounts of information in blue sheets, and dark pools of liquidity. Collection and analysis of a broad range of data can enable better management of financial network system dynamics and the systemic risk that can emerge from within such networks.

The fragmentary nature of existing regulatory frameworks makes comprehensive assessment of systemic risk more difficult than it should be. This suggests that considerations of financial market risk could be strengthened by the ability of a Market Stability Regulator with the risk management responsibilities outlined in the Blueprint. Even if the Blueprint is not adopted, its conception of the information collection role of a Market Stability Regulator should be a central aspect of confronting and in the future avoiding the types of systemic risk that led to the credit crisis. In contrast to the Treasury Blueprint, Khandani and Lo envisage a “Capital Markets Safety Board” that plays a similar role to the National Transportation Safety Board when airplanes crash. A Market Stability Regulator, which could be as conceived in the Treasury

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627 See supra notes __ to __ and accompanying text.
628 Khandani & Lo, supra note 625, at 55-56.
629 Id.
630 GAO, supra note 32; Ruder, supra note 474, at ___ (“New regulations are needed in order to protect hedge fund investors and in order to monitor hedge fund contributions to systemic risk.”).
631 Khandani & Lo, supra note 625, at 30.
632 Id.
634 Khandani & Lo, supra note 625, at 56 (“By establishing a dedicated and experienced team of forensic accountants, lawyers, and financial engineers to monitor various aspects of systemic risk in the financial sector, and
Blueprint, a neutral third party, a separate regulator with systemic risk responsibility, or some combination thereof, would collect data concerning past events to gain better understanding of the forces that have precipitated market crises in the past. A Market Stability Regulator would also have a prospective role in monitoring and measuring systemic risk, using quantitative and qualitative data and models that have incorporated learning from ongoing data collection.

The goals of a Market Stability Regulator in managing risk should be to collect, analyze, and, when possible, publish data to facilitate the establishment of firewalls that can be used to both avert financial epidemics and prevent financial contagion from spreading. A Market Stability Regulator would thus need the ability to collect information from a broad range of market participants. In addition to collecting data about trading and other activities at both regulated and unregulated entities, a Market Stability Regulator should collect data concerning the activities and performance of regulators and the costs and benefits of regulatory compliance and enforcement more generally. Data collected by a Market Stability Regulator should be publicly reported to the greatest extent possible with appropriate redaction of nonpublic or proprietary information. A complex and interconnected financial system requires sophisticated data collection and analysis to ensure that analysis of network of risk by regulators and firms reflects an understanding of the reality on the ground within financial market networks.

E. Risk Education and Risk Penalties: Creating Incentives for Better Risk Management and Disclosure

Other actions that may help better align internal industry incentives include intensifying penalties for behaviors that create systemic risk, creating broader mechanisms for education about risk at all levels of activities, and developing better risk disclosure practices from market participants.

1. Sliding Scale Risk Penalties

In addition to ensuring that private market discipline rests on incentives that encourage market participants to properly price risk, regulatory penalties should be reconsidered in light of existing incentives. Auction Rate Securities were the subject of a previous SEC settlement in which firms settled SEC charges for $13 million. This settlement is negligible when compared to the amount of money that banks made underwriting and managing ARS auctions. The revenues that would flow from a $330 billion market, with banks earning 1 percent for underwriting fees and 25 basis points for each auction are far in excess of the $13 million SEC settlement. For example, if the $330 billion sales were to have occurred in a single year, with auctions of all outstanding ARS once monthly, bank revenues from ARS underwriting fees alone in that year would exceed $3 billion. Given the monetary incentives that existed in the ARS market, sliding scale penalties might in some instances provide a better mechanism for aligning incentives. Sliding scale regulation has been applied in the context of regulated industries such

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635 See supra notes ___ to ___ and accompanying text.
636 One percent of $330 billion would garner $3.3 billion in annual underwriting fees.
as telecommunications.\textsuperscript{637} In the securities law context, sliding scale penalties could be conceptualized as forced profit or revenue sharing with payment into a fund established by regulators for serious first violations or continuing smaller violations. Assuming that the amount of the profit or revenue sharing could be set at an appropriate level, the prospect of such profit or revenue penalties would likely facilitate internal firm risk management and shareholder monitoring to avoid such penalties.

2. Risk Education and Interactive Disclosure

The credit crisis demonstrates significant need for better financial education with respect to risk both for sophisticated market participants and regulators who must both have better comprehensive understanding of complex financial products, trading strategies, and networks. Financial market regulation based on an assumption of private market discipline implicitly assumes that market participants have sufficient knowledge and education to enable them to effectuate the discipline that is part of the foundation on which market regulation rests. Although education is at best a blunt weapon, pervasive lack of knowledge by multiple parties is no doubt a factor in the crisis. The ARS market, for example, was developed by broker-dealers who were willfully ignorant about the products they sold: interviews by Massachusetts officials with ARS financial advisors revealed knowledge based on conversations with other advisors and anecdotal understanding of the products that they were selling, much of which was incorrect.\textsuperscript{638} Customers to whom ARS were sold also in many instances lacked knowledge about what they were buying, including sophisticated purchasers such as Pulitzer Prize winning financial writer James Stewart.\textsuperscript{639}

In addition to better professional education for market participants and regulators, consideration should be given to ways to make retail investor education more interactive. Although professional investors also rely on disclosure documents, current disclosure targeted at retail investors has been criticized because little evidence exists that such targeted investors actually read such documents.\textsuperscript{640} Further, current methods for determining investor qualification may also inadequate. In addition to the financial thresholds that existing for individual investors under Regulation D,\textsuperscript{641} greater consideration should be given to having standardized investor


\textsuperscript{638} In the Matter of UBS Securities, \textit{supra} note 284, at 25 (noting that the UBS financial advisors interviewed by Massachusetts officials “had not received any instruction or compliance training with respect to ARS” and did not even have “the most basic understanding of how ARS worked” until UBS stopped supporting auctions).

\textsuperscript{639} Stewart, \textit{supra} note 284.

\textsuperscript{640} Donald Langevoort, \textit{Taming the Animal Spirits of the Stock Market: A Behavioral Approach to Securities Regulation}, 97 NW. U. L. REV. 135, 173 (2002) (noting that the SEC has “never studied investor behavior deeply enough to say—publicly at least—what percentage of investors read or understand these documents, or what influence the fundamental analysis-oriented disclosure has on their investment decisions.”).

\textsuperscript{641} Regulation D, 17 C.F.R. § 230.501(a) (2005) (defining an accredited individual investor to include persons with an individual or joint net worth in excess of $1 million and individual income in excess of $200,000 or joint income
tests as a key aspect of private market discipline. Truly assessing investor qualification should
go beyond the check the box approach of some investor qualification questionnaires. This could,
for example, involve developing interactive investor knowledge tests (IKTs), which could be
g geared to the specific nature of varied investment opportunities. The point of such tests would
not be to require a particular score from a prospective investor alone or together with the
investor’s representative, but to help ensure that potential investors and financial service
providers are forced to focus on the types of financial instruments, trading strategies, and risks of
potential investment opportunities. Such IKTs could help increase investors’ awareness about
what they should know or investigate prior to participating in a particular investment. A hedge
fund, for example, could have a stated level of preferred IKT score for a particular investment
opportunity. Investors below that level could participate but they and the hedge fund managers
would be on notice that they might not understand the risks of the investment. IKTs could
facilitate better incorporation of risk into decision making by clarifying in an interactive manner
the nature of knowledge that might be desired of participants in particular investment
opportunities.

Better risk education is an important factor in enhancing risk management. The credit crisis
highlights a widespread inattentiveness to questions of risk. Purchasers of complex structured
products had in many cases limited understanding of what they were buying. Even those with
complex models that appeared to reflect an understanding of the mathematics of complex
financial products used models that were not realistic and that contributed to a false sense of
security. Some of the lack of attention to risk is related to incentive structures within the
financial services industry. However, better risk education might encourage even sophisticated
market participants and regulators to question more closely transactions and investment
opportunities such as the Madoff Ponzi scheme that seemingly offer a riskless premium return.

3. Risk Management, Risk Disclosure, and Leverage

Regulated entities in the U.S. bear much of the cost of the inefficient patchwork system of U.S.
regulation. The current crisis unfolded within entities that are subject to multiple layers of
regulation, which does not reflect well upon the ability of existing frameworks to adequately
identify and create firewalls around sectors or entities that threaten market integrity. The
patchwork nature of financial markets regulation thus makes true assessment of network risk
virtually impossible because each separate regulator lacks a comprehensive vision of the system
as a whole. Further, regulatory coordination with respect to system risk management is unlikely
to be any more successful in the future than it has been in the past both due to regulatory

in excess of $300,000 in the two most recent years with a reasonable expectation of the same level of income in the
current year).

642 GAO, supra note 32, at 29 (noting that the ability of market discipline to control hedge fund risk is limited by
some investors’ inability to understand and evaluate the hedge fund information they receive).

643 Scanell, supra note 547 (“The revelations are the latest blow to the reputation of an agency that has been
criticized for insufficient enforcement and the failure to better monitor the dangerous risk-taking on Wall Street that
triggered this year’s financial crisis.”).

644 Nouriel Roubini, The Shadow Banking System is Unraveling, FIN. TIMES, Sept. 21, 2008,
marking of turf, as well as divergence in regulatory treatments that would tend to emerge among various regulators over time.

Reducing or reframing risk is a good starting point in risk management and control within financial firms. Reframing risk would entail more comprehensive internal company consideration of risk, as well as limitations on leverage both through external regulatory monitoring and internal risk management. Companies should also be encouraged to follow best practices with respect to compensation or bonuses that are based on performance. Such best practices should entail greater consideration of the ways in which financial rewards take account of risks and might include, for example, creating a clawback or tail for compensation that matches the time horizon of receipt of compensation to the time horizon of trading activities for which an employee is compensated. Regulated companies in the financial services industry should also be required to disclose internal risk management and control in detail as well as the alignment between compensation and risk as a part of mandatory disclosure compliance in risk disclosure discussions. All regulated and unregulated companies should also be required to disclose immediately to the Market Stability Regulator all material incidents that reflect a failure of risk control or risk management.

Regulated entity disclosure requirements should be supplemented to require additional disclosure concerning dynamic risk. Required risk disclosure under Regulation S-K, which contains many of the specific disclosure requirements to which reporting companies are subject, reflects a largely top down perspective. Mandatory disclosure about risk should be supplemented to include greater bottom-up perspectives, including discussion of company risk management policies and training, the specific ways in which employee compensation, not just for senior executives, aligns with the potential risks that employees may undertake. Such disclosure is particularly important for all employees that directly engage in capital market trading activities.

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

In the final analysis, regulation and internal risk management should have a common goal of containing negative externalities that may flow from trading and other financial market activities. In addition to regulatory changes, regulators should strongly encourage financial market participants to manage risk collectively through mechanisms such as insurance and the creation of industry bailout pools that may help to spread risk that arises from financial market activities among market participants. Market models exist in other arenas that could be a starting point in shaping financial market participants’ efforts to develop mechanisms to prevent the socialization of their losses to the broader society. Such models could be developed in conjunction with existing regulatory mechanisms that are intended to manage risk. Although the implementation of industry-sponsored models is likely to be complex and challenging, such models offer a potential avenue for ameliorating the impact of future market crises. By potentially mitigating network effects, these models could also provide teeth to private market discipline by permitting even large or highly networked market players to fail, which will likely provide better incentives
for more comprehensive industry risk management.

Forms of additional market insurance might supplement existing financial market insurance programs available through the Federal Deposit Insurance Corporation (FDIC), which insures bank deposits, and Securities Investors Protection Corporation (SIPC), which insures broker-dealer accounts. A recent Canadian task force considered capital market insurance as a bold step that could distinguish Canada’s capital markets and enhance Canadian capital market competitiveness. The insurance discussed in the Canadian report would insure investors against losses due to misinformation in the marketplace. The Canadian proposal highlights to possibility of varied types of insurance mechanisms that could ameliorate risk in capital market contexts. Insurance would not by itself solve potential problems related to risk, but could be used to spread risk and supplement firewalls in the event of broader systemic problems or network failure.

Self-insurance may also be an option worth considering. Large law firms in the U.S. offer a potential model for self-insurance, although this model is likely not fully transferable to the capital market context. The Attorneys’ Liability Assurance Society (ALAS), was founded in 1979 and is the largest lawyer-owned mutual insurance company in the U.S. From an original $1 million in capital and 35 law firms, ALAS membership now includes 242 firms and 61,000 lawyers in 46 states and the District of Columbia, with total assets of over $2.2 billion. Membership in ALAS is subject to careful ALAS underwriting, including on-site underwriting reviews and significant scrutiny prior to acceptance. ALAS also makes recommendations concerning law firm structure and procedures. As is the case with lawyers, structures 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.

Although the scope and magnitude of financial industry insurance is vast in comparison to lawyer self-insurance, insurance mechanisms may help to actually implement the private market discipline that is remains core assumption of U.S. financial market regulatory frameworks. Regulators could thus either encourage or require use of more insurance mechanisms in financial markets. The establishment of clearinghouses similar to those in the commodities arena might

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647 GAO, SECURITIES INVESTOR PROTECTION: STEPS NEEDED TO BETTER DISCLOSE SIPC POLICIES TO INVESTORS, at 3, May 2001 (noting that the Securities Investor Protection Act of 1970 created the Securities Investor Protection Corporation (SIPC), which helps protects customers from losses resulting from securities firm failures); George J. Benston & George G. Kaufman, Deposit Insurance Reform in the FDIC Improvement Act: The Experience to Date, 22 FRBCHICAGO ECON. PERSPECTIVES 2 (1998) (discussing modifications to the structure of FDIC insurance).


649 Id. 149.

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


652 Standard & Poor’s, RatingsDirect, Attorneys’ Liability Assurance Society (Bermuda) Ltd. And Attorneys’ Liability Assurance Society Inc. RRG, at 4, April 4, 2008.

653 SHAPIRO, supra note 650, at 38.

654 La Porta, Lopez-De-Silanes & Shleifer, supra note 14, at 27 (finding in empirical study that securities laws matter most as a basis for facilitating private contracting, standardized disclosure, and private dispute resolution rather than with respect to the role of public securities law regulatory enforcers).
be another potential avenue to monitor and reduce risk. Clearinghouses are being implemented, for example, in the CDS market. The creation of industry-sponsored bailout pools is another industry-based mechanism to promote the internalization of risk by financial market participants. Payments into the bailout fund could be based on an agreed upon formula that might reflect an incremental fee attached to certain types of financial market activities or even compensation holdbacks from employee bonuses. Regulators could monitor the composition and any payouts from such private bailout funds. The goal of industry sponsored bailouts would be to ensure that firewalls could be established around troubled or failed participating financial institutions and any necessary financial rescues paid for by financial market participants rather than the general public.

CONCLUSION

Confidence is a huge factor in the financial services industry. In addition to causing significant market volatility and instability, market crises may deleteriously impact market confidence. In an industry where physical assets are few and intangible assets such as reputation paramount, a failure in confidence may also cause financial markets to freeze. A crisis of confidence can be difficult to overcome.

Market crises often test confidence and may even trigger regulatory reactions that toughen the application of existing legal frameworks or lead to adoption of new ones that may be in large part a response to a particular market crisis. The current market crisis unfolded in part in arenas with significant existing regulatory frameworks. This suggests that reactions to the current crisis should be tempered and initiated at the same time as an overall assessment of regulation prior to the adoption of any new regulatory requirements. Secondly, regulatory reforms in response to the current crisis should be shaped by acknowledgment of a fundamental shift in the nature of trading activities and financial market networks. Changing technology has shaped trading activities in a broad range of entities, both regulated and unregulated. The incentives that govern traders and other market participants can play an enormous role in determining the extent to which financial market networks embody speculative risktaking trading activities or reflect more cautious approaches to risk that truly incorporate private market discipline and that minimize the potential for systemic market instability and network failure.

657 Surowiecki, *supra* note 432.