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Keynote Address: Understanding the Subprime Financial Crisis

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KEYNOTE ADDRESS: UNDERSTANDING THE SUBPRIME FINANCIAL CRISIS¹

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I. HOW AND WHY DID THE FINANCIAL CRISIS HAPPEN?	

Although we are now in a global credit and financial crisis,² we refer to its earlier stages as a “subprime mortgage crisis.”³ However, the making and monetization of subprime mortgages was not per se evil.⁴ Lenders made

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1. This Keynote Address was delivered on October 24, 2008 at the *South Carolina Law Review* Symposium entitled *1.9 Kids and a Foreclosure: Subprime Mortgages, the Credit Crisis, and Restoring the American Dream*. Parts of the Keynote Address derive from the author’s published and forthcoming articles. Steven L. Schwarcz, *Complexity as a Catalyst of Market Failure: A Law and Engineering Inquiry* (Duke Law Sch. Pub. Law & Legal Theory, Research Paper No. 217, 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1240863 [hereinafter Schwarcz, *Complexity*]; Steven L. Schwarcz, *Conflicts and Financial Collapse: The Problem of Secondary-Management Agency Costs*, 26 YALE J. ON REG. (forthcoming Summer 2009), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1322536 [hereinafter Schwarcz, *Conflicts*]; Steven L. Schwarcz, *Disclosure’s Failure in the Subprime Mortgage Crisis*, 2008 UTAH L. REV. 1109 [hereinafter Schwarcz, *Disclosure’s Failure*]; Steven L. Schwarcz, *Markets, Systemic Risk, and the Subprime Mortgage Crisis*, 61 SMU L. REV. 209 (2008) [hereinafter Schwarcz, *Markets*]; Steven L. Schwarcz, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*, 93 MINN. L. REV. 373 (2008) [hereinafter Schwarcz, *Protecting Financial Markets*]; Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L.J. 193 (2008) [hereinafter Schwarcz, *Systemic Risk*].

2. See, e.g., Tyler Cowen, *Three Trends and a Train Wreck*, N.Y. TIMES, Oct. 19, 2008, at B6 (“The crisis is global in nature and its causes are more general and less country-specific than is commonly reflected in the political discourse of any single nation.”).

3. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 373 n.1 (“The term ‘subprime’ includes both loans to borrowers of dubious creditworthiness and very large loans to otherwise creditworthy borrowers.”).

4. But cf. Gary B. Gorton, *The Panic of 2007*, at 2 (Nat’l Bureau of Econ. Research, Working Paper No. 14358, 2008), available at <http://www.nber.org/papers/w14358> (“[The] chain of securities and the information problems that arose [to cause the financial crisis] are unique to subprime mortgages.”).

mortgage loans available to even risky borrowers,⁵ but there were several reasons why, besides greed: to some extent, lending to risky borrowers followed a time-tested credit card model in which credit is made easily available and high interest rates are charged in order, statistically, to offset losses. Furthermore, mortgage lenders, unlike credit card lenders, have not only one way out—cash flow—but also a second way out—collateral.⁶

This model worked brilliantly so long as home prices appreciated, as they had been doing for decades. The model also was consistent with the government's strong encouragement of lenders to make mortgage loans to low income—and often “disproportionately minority”⁷—borrowers.⁸ Enabling the making of mortgage loans in many cases without documentation of borrower income, the model also recognized, at least implicitly, that many seemingly low income borrowers are actually paid on a cash basis, without officially declaring their income.⁹ Therefore, not completely unlike the argument by economist Hernando de Soto that de facto property rights should be recognized in order to enable the poor to borrow and acquire capital,¹⁰ the model enabled de facto income to be recognized, on a statistical basis, in order to enable the poor to borrow money and acquire homes.¹¹

When home prices stopped appreciating, the model failed for those borrowers who were relying on refinancing for loan repayment. Lenders often made loans to risky borrowers under adjustable-rate mortgages (ARMs), with the expectation that because of home appreciation, the mortgagor would be able

5. See, e.g., Mortimer Zuckerman, *We Deserve a Better Bailout*, U.S. NEWS & WORLD REP., Oct. 20, 2008, at 80 (“[During the housing boom] [p]eople with no credit history and insufficient income were enabled to buy homes with no money down—often at ridiculously high prices.”).

6. Because collateral was the primary way out for some subprime loans, the statement in the text above is more of a comparative assessment.

7. Gorton, *supra* note 4, at 3. See also *id.* at 5 (“Home ownership for low income and minority households has been a long-standing national goal.”).

8. See, e.g., Zuckerman, *supra* note 5 (“In the early days of the housing boom, members of Congress won votes by pressing for ‘affordable housing’ for everyone.”).

9. Gorton, *supra* note 4, at 6 (observing that because the poor often engage in a cash economy, many poor people “are earning income but cannot prove it in the way most lenders want them to, with a W-2” (quoting Interview with Stephanie Smith, Nat’l Manager of Cmty. Lending, Bank of Am., in S.F., Cal. (Jul. 9, 2008), cited by David Listokin & Elvin K. Wyly, *Making New Mortgage Markets: Case Studies of Institutions, Home Buyers, and Communities*, 11 HOUSING POL’Y DEBATE 575, 604, 606, 625 (2000))).

10. HERNANDO DE SOTO, *THE MYSTERY OF CAPITAL: WHY CAPITALISM TRIUMPHS IN THE WEST AND FAILS EVERYWHERE ELSE* 5–6, 210 (2000).

11. See Gorton, *supra* note 4, at 6–7 (citing Interview with Stephanie Smith, Nat’l Manager of Cmty. Lending, Bank of Am., in S.F., Cal. (Jul. 9, 2008), cited by David Listokin & Elvin K. Wyly, *Making New Mortgage Markets: Case Studies of Institutions, Home Buyers, and Communities*, 11 HOUSING POL’Y DEBATE 575, 604, 606, 625 (2000)) (explaining that “undocumented income” was one reason why banks began extending subprime mortgages).

to refinance to a lower rate mortgage before the ARM rate increase kicked in.¹² When the borrower had little de facto income, refinancing would be a significant means by which these mortgages would be paid.¹³ When home prices stopped appreciating, these borrowers could not refinance; in many cases, they defaulted.¹⁴ Nor was the “originate-to-distribute” model of mortgage lending, and its (allegedly) resulting moral hazard, the central problem causing the crisis, as some have alleged.¹⁵ This model is critical to ensuring lending liquidity.¹⁶ Investors and credit insurers taking the ultimate risk on securities backed by the mortgages should have more carefully assessed, and in the (near, at least) future assuredly will carefully assess, their risk.

The financial crisis resulted from a cascade of failures, initially triggered by the historically unanticipated depth of the fall in housing prices.¹⁷ In one sense, the precipitous drop in home prices was unexpected.¹⁸ Like Monty Python’s skit, “NOBODY expects the Spanish Inquisition.”¹⁹ In another sense, though, the fall arguably should have been anticipated based on the liquidity glut²⁰ and artificially low interest rates, driving up housing prices artificially. Because of the fall in housing prices, low income borrowers who could not refinance

12. See *id.* at 12–13.

13. See *id.* at 51.

14. *Id.*

15. See *id.* at 68 (stating that the originate-to-distribute model is the “dominant explanation” for the financial panic). Under the originate-to-distribute model, mortgage lenders sell off loans as they are made. See, e.g., Richard J. Rosen, *The Role of Securitization in Mortgage Lending*, CHI. FED. LETTER (Fed. Reserve Bank of Chi., Chi., Ill.) Nov. 2007, at 1, available at http://www.chicagofed.org/publications/fedletter/cflnovember2007_244.pdf (explaining that unlike lending practices common several decades ago, mortgages today are most often sold to third parties shortly after being written).

16. See, e.g., BANK FOR INT’L SETTLEMENTS, THE JOINT FORUM ON CREDIT RISK TRANSFER: DEVELOPMENTS FROM 2005 TO 2007, at 7 (2008), available at http://fsforum.org/publications/r_0804c.pdf (“[Securities firms and banks] can profit from originating, structuring and underwriting [credit risk transfer] in a wider range of asset classes. They can earn fees while not having to hold the associated credit risk or fund positions over an extended time period.”).

17. See Gorton, *supra* note 4, at 49–50.

18. Cf. *id.* at 50 n.57 (“The United States has not experienced [a] large, nationwide decline in house prices since the Great Depression of the 1930s.”).

19. *Monty Python’s Flying Circus: The Spanish Inquisition* (BBC One television broadcast Sept. 22, 1970) (transcript available at <http://people.csail.mit.edu/paulf/itz/spanish/script.html> (last visited Feb. 9, 2009)).

20. See, e.g., Steven Pearlstein, *Did You Hear the One About the Trade Deficit?*, WASH. POST, Feb. 15, 2006, at D1 (“[Economists’] warning is that [the trade deficit] is, to a large extent, really a ‘liquidity glut’ caused by central banks, primarily those of China and Japan.”). There appear to have been various causes contributing to this glut, including the U.S. Federal Reserve providing inexpensive lending to banks to deter the financial impact of the dot-com bust and foreign sovereign wealth funds pouring cheap money into U.S. capital markets.

through home appreciation were more likely to default.²¹ Even borrowers who could afford paying their mortgages were more tempted to walk away as mortgage loans exceeded home values. These defaults in turn caused substantial amounts of low investment-grade mortgage-backed securities to default and AAA-rated securities to be downgraded.²² The defaults were especially large for ABS CDO securities—a class of securities backed indirectly by subprime mortgages and other assets²³—because of the leveraged sensitivity of these securities to underlying mortgage defaults.²⁴

That, in turn, spooked investors who believed that AAA meant ironclad safety and that investment grade meant relative freedom from default. Investors started losing confidence in ratings and avoiding debt securities. Fewer investors meant that the price of debt securities started falling. Falling prices meant that firms using debt securities as collateral had to mark them to market and put up cash—requiring the sale of more securities—which caused market prices to plummet further downward in a death spiral.²⁵ The high leverage of many firms appears to have made this death spiral worse.²⁶ Encouraged by the earlier liquidity glut, many firms had borrowed excessively because the cost of funds was so cheap.²⁷

The refusal of the government to save Lehman Brothers in mid-September 2008, and its resulting bankruptcy, added to this cascade. Debt markets became so spooked that even the commercial paper market virtually shut down. And the market prices of mortgage-backed securities collapsed substantially below the

21. Gorton, *supra* note 4, at 51.

22. See, e.g., MONETARY & CAPITAL MKTS. DEPT., INT'L MONETARY FUND, GLOBAL FINANCIAL STABILITY REPORT: CONTAINING SYSTEMIC RISKS AND RESTORING FINANCIAL SOUNDNESS 55 (2008) [hereinafter GLOBAL FINANCIAL STABILITY REPORT], *available at* <http://www.imf.org/external/pubs/ft/gfsr/2008/01/pdf/text.pdf> (“In . . . 2007, the three main credit rating agencies were forced to make precipitous downgrades on a large number of structured finance products backed by U.S. subprime mortgages The downgraded securities included some rated AAA, which is the safest rating possible.”). For a discussion of rating agencies and their ratings, see Steven L. Schwarcz, *Private Ordering of Public Markets: The Rating Agency Paradox*, 2002 U. ILL. L. REV. 1, 7–8.

23. For an explanation and comparison of the different types of mortgage-backed securities, including CDO and ABS CDO securities, see Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 376–79.

24. See *id.* at 376, 378–79.

25. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 396–97.

26. *Id.* (citing Clifford De Souza & Mikhail Smirnov, *Dynamic Leverage: A Contingent Claims Approach to Leverage for Capital Conservation*, J. PORTFOLIO MGMT., Fall 2004, at 25, 28).

27. See *supra* note 20 and accompanying text.

intrinsic value of the mortgage assets underlying those securities.²⁸ These events epitomize systemic risk, in which,

(i) an economic shock such as market or institutional failure triggers (through a panic or otherwise) either (X) the failure of a chain of markets or institutions or (Y) a chain of significant losses to financial institutions, (ii) resulting in increases in the cost of capital or decreases in its availability, often evidenced by substantial financial-market price volatility.²⁹

This collapse in market prices meant that banks and other financial institutions holding mortgage-backed securities had to write down the securities' value. That caused these institutions to appear more financially risky, in turn triggering concern over counterparty risk; afraid these institutions might default on their contractual obligations, many parties stopped dealing with them.³⁰ There was, in other words, an information failure caused by lack of transparency as to counterparty financial condition.³¹

In early October, the federal government stepped in to the rescue with the Emergency Economic Stabilization Act of 2008 (EESA), popularly known as the Troubled Asset Relief Program or TARP.³² But the Federal Reserve spearheaded the federal government's actions until September 2008 and focused almost exclusively on protecting banks and other financial institutions against collapse.³³ This narrow focus reflected the Fed's historical and legal mission—memorialized in its organizing laws—which enables it, in “unusual and exigent circumstances,” to act as a lender of last resort to banks and other financial

28. See, e.g., GLOBAL FINANCIAL STABILITY REPORT, *supra* note 22 (discussing how investors' unwillingness to invest in mortgage-backed securities “drove market valuations down to levels below theoretical assumptions”).

29. Schwarcz, *Systemic Risk*, *supra* note 1, at 204.

30. See, e.g., Steven L. Schwarcz, *Markets, Systemic Risk, and the Subprime Mortgage Meltdown*, HUFFINGTON POST, Mar. 18, 2008, http://www.huffingtonpost.com/steven-schwarcz/markets-systemic-risk-a_b_92198.html (discussing how investors began to avoid financial institutions such as Bear Stearns once these financial institutions had to write down the value of their mortgage-backed securities).

31. This can be thought of as a form of adverse selection—an inability to distinguish good market participants from bad market participants, motivating lenders to avoid extending credit to any market participants.

32. Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, 122 Stat. 3765 (to be codified at 12 U.S.C. § 5201 note).

33. See Press Release, Neel Kashkari, Interim Assistant Sec'y, U.S. Dep't of Treasury, Interim Assistant Secretary Neel Kashkari Remarks on Implementation of the Emergency Economic Stabilization Act (Nov. 19, 2008), *available at* <http://www.treasury.gov/press/releases/hp1281.htm> (outlining the actions by the Department of the Treasury and the Federal Reserve).

institutions.³⁴ Such a narrow focus worked well when banks and institutions were the primary source of corporate financing. But as the current financial crisis reveals, this focus is insufficient now that companies engage in disintermediation—obtaining much of their financing directly through capital markets.³⁵ Although there is currently great attention paid to the need for the government to bail out banks and other financial institutions, these institutions would not have needed to be bailed out if their investment securities had maintained market value reasonably corresponding to their intrinsic value.³⁶

In this context, I believe that some commentators and media have created semantic confusion: claiming that the fundamental problem is one of institutional solvency, not liquidity.³⁷ That claim conflates two different meanings of solvency. The fundamental problem is the loss in market value of investment securities held by banks and other financial institutions.³⁸ This loss in value represents a liquidity problem, in that the financial markets have few buyers for these securities.³⁹ Because the intrinsic value of these securities is much greater than their market value,⁴⁰ these institutions are not necessarily insolvent in the traditional sense of a fair valuation of their assets being less than their liabilities. Some institutions may well be insolvent, though, in the term's other (and less used) sense of being illiquid—being unable to meet their liabilities as they come due. This would occur where institutions need to sell investment securities to meet those liabilities, and the market price that would be received in the sale would be insufficient.⁴¹

34. Federal Reserve Act § 13(3), 12 U.S.C. § 343 (2006).

35. Schwarcz, *Systemic Risk*, *supra* note 1, at 200 (explaining that disintermediation is the rising trend of companies gaining “access [to] the ultimate source of funds, the capital markets, without going through banks or other financial intermediaries” (citing Steven L. Schwarcz, *Enron and the Use and Abuse of Special Purpose Entities in Corporate Structure*, 70 U. CIN. L. REV. 1309, 1315 (2002))).

36. See, e.g., Steven L. Schwarcz et al., Op-Ed., *How Three Economists View a Financial Rescue Plan*, N.Y. TIMES, Sept. 22, 2008, at C4 (arguing that the underlying disease was financial market failure and that the failure of banks and other financial institutions was merely a symptom of the disease). Some believe, however, that the banking system is “fundamentally unsound.” See, e.g., Cowen, *supra* note 2 (“Many countries—not just the United States—came to have fundamentally unsound banking systems.”). To the extent the banking system is unsound, I believe it is because of the loss in value of investment securities held by banks, as described above.

37. See, e.g., Cowen, *supra* note 2 (claiming that the banking system is “fundamentally unsound”).

38. See GLOBAL FINANCIAL STABILITY REPORT, *supra* note 22; Schwarcz, *supra* note 30.

39. See GLOBAL FINANCIAL STABILITY REPORT, *supra* note 22; Schwarcz, *supra* note 30.

40. See *supra* text accompanying note 28; *infra* text accompanying note 153.

41. Cf. Steven L. Schwarcz, Op-Ed., *Beyond the Bailout*, FORBES.COM, Oct. 8, 2008, http://www.forbes.com/2008/10/08/bailout-securities-regulation-oped-cx_sls_1008schwarcz.html (explaining that in times of financial crises, “Investors lose confidence by requiring companies to sell assets to meet margin calls, which can artificially depress asset prices and cause a downward spiral.”).

EESA may be needed to defuse the ongoing financial crisis, but at an unfortunate cost to taxpayers.⁴² If, for example, the government had strategically purchased mortgage-backed and similar securities at the outset of the crisis to stabilize markets, the credit collapse might have been avoided or lessened in impact,⁴³ and we would not now be needing \$700 billion, or more, of taxpayer dollars.⁴⁴ At that time, however, there may not have been the political will to use taxpayer money in this innovative way.

II. HOW REALISTIC IS EESA?

As mentioned, I believe a bailout was needed. I am not a macroeconomist and do not want to make predictions on how seriously the real economy would have been impacted absent EESA. I do think that, potentially, it could have been very badly impacted, possibly even leading to an economic depression.⁴⁵ As I

42. For further discussion on this issue, see Schwarcz, *supra* note 36 (explaining how the cost to taxpayers would have been reduced if the Treasury had acted at the outset of the financial panic).

43. See *id.*; see also *infra* text accompanying notes 151–72 (providing an example of how strategically purchasing securities could stabilize market prices).

44. I urged Congress, in October 2007, to consider a process for making these types of strategic purchases. See *Systemic Risk: Examining Regulators' Ability to Respond to Threats to the Financial System: Hearing Before the H. Comm. on Financial Servs.*, 110th Cong. 21 (2008) [hereinafter *Hearing*] (statement of Steven L. Schwarcz, Stanley A. Star Professor of Law and Business, Duke University School of Law), available at http://frwebgate.access.gpo.gov/cgibin/getdoc.cgi?dbname=110_house_hearings&docid=f:39903.pdf; see also Steven L. Schwarcz, Editorial, *Fed Must Also Guard Financial Markets*, STAR-LEDGER (Newark, N.J.), Sept. 17, 2007, at 15 (arguing that a lender of last resort could stabilize a failing financial system by buying troubled securities); Schwarcz, *supra* note 30 (explaining how a “liquidity provider of last resort” could restore confidence in a troubled market by establishing a floor for plummeting prices); Steven L. Schwarcz, Editorial, *Protecting Against Economic Shocks*, BALTIMORE SUN, Sept. 17, 2007, at 13A (“The [Federal Reserve] should . . . take reasonable precautions against economic shocks that can seriously damage the economy.”); Steven L. Schwarcz, Op-Ed., *Systemic Risk Meets Subprime Mortgages*, FORBES.COM, May 1, 2008, http://www.forbes.com/2008/05/01/subprime-fed-system-op-ed-cx_sls_0501subprime.html (analyzing the factors that lead to market failure which triggered the subprime mortgage crisis and offering solutions for reforming market regulation).

45. See, e.g., Zuckerman, *supra* note 5, at 79 (arguing that not passing bailout legislation would “threaten[] the continuation of the economic life we know and [create] the specter of a crisis even greater than the 1930s”). I am not quite certain why legislators proposed the bailout in such urgency, though. Certainly the bankruptcy of Lehman Brothers, the bailout of American International Group (AIG), and the flight of capital from traditionally safe money market funds to U.S. Treasury bills were wake-up calls to action. See, e.g., *Turmoil in US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions: Hearing Before the Comm. on Banking, Housing, and Urban Affairs*, 110th Cong. 3 (2008) (statement of Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys.), available at http://banking.senate.gov/public/_files/BERNANKESStatement092308_SenateBankingCommittee.pdf (discussing the collapse of Lehman Brothers and AIG and how an increase demand for Treasury bills sent yields down to “a few hundredths of a percent”). The urgency may also have

have said before: “With luck, the \$700 billion authorized will, like a hospital emergency room helping a patient, begin to stabilize credit markets and financial institutions.”⁴⁶ But it is only a first step. To regain financial health, we need to take additional steps, both in the short term and the long term. I will discuss what additional steps may be needed after commenting briefly on EESA’s terms.

The major thrust of the bailout plan is for the government to minimize the appearance, if not the actuality, of counterparty risk. Under the original plan, counterparty risk would be minimized primarily by the government purchasing mortgage-backed securities from banks and other financial institutions at a price above the collapsed “market” price but, hopefully, at a deep discount from what the securities are intrinsically worth.⁴⁷ This would effectively recapitalize these institutions with more transparently valuable assets—cash. However, this approach ran into immediate political hurdles based on misunderstanding the distinction between market price and intrinsic value.⁴⁸ Because the purchase price paid by the government would have to be above “market” to avoid even further counterparty write-offs, there was a populist perception that the government would be unjustifiably bailing out Wall Street.⁴⁹ In response, the government now plans to recapitalize banks and other financial institutions primarily by purchasing preferred, non-voting stock.⁵⁰ This approach is consistent with the approach taken by the United Kingdom and the European

reflected inside knowledge that other financial institutions beyond AIG and Lehman Brothers, like Wachovia, were in imminent danger of collapsing. Some urgency might also have reflected concern about a chain of defaults in credit default swap obligations. *See infra* note 136 and accompanying text (defining a credit default swap). More cynically, some of the urgency might even have reflected the Bush Administration’s use of fear to push through a rescue plan, thereby appearing to begin solving the economic problem while in office and minimizing criticism. Whatever the reason, the urgency in which legislators proposed the bailout itself created market panic—by announcing the urgent timing, the government created a scenario in which the markets would lose even more confidence if the Treasury’s plan was not promptly enacted.

46. Schwarcz, *supra* note 41.

47. Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, § 101(a)(1), 122 Stat. 3765, 3767 (to be codified at 12 U.S.C. § 5211) (authorizing the Secretary of the Treasury to purchase troubled assets).

48. *See, e.g.,* Zuckerman, *supra* note 5 (arguing that buying the mortgage-backed securities at above market prices “provides[s] a huge, unjustified bailout for Wall Street” by “rescu[ing] the financial industry from the consequences of its own misjudgments, profligacy, and greed”).

49. *See, e.g., id.*

50. *See, e.g.,* Joshua Brockman, *Is the U.S. ‘Nationalizing’ Banks?*, NPR, Oct. 14, 2008, <http://npr.org/templates/story/story.php?storyId=95700786> (“In a bid to restore confidence in the financial markets and jump-start lending activity, the Treasury said it would buy up to \$250 billion of preferred shares of stocks in U.S. banks and savings and loans.”).

Union and thus establishes a united front globally.⁵¹ It also is more consistent with what a majority of economists appear to be calling for.⁵²

I would prefer that the government purchases assets rather than stock, since the former does not get the government involved with ownership of private institutions. But both approaches can work. Consider purchasing assets—in this case, mortgage-backed securities. If the purchase price of the mortgage-backed securities is, as believed, much lower than the intrinsic value of the securities,⁵³ the government, and therefore taxpayers, would profit. However, buying mortgage-backed securities has its own issues, of course. Mortgage-backed securities are hard to price absent transparency of the condition of the underlying assets—such as mortgage loans—and their obligors.⁵⁴ Part of the very reason that the market has failed is that disclosure of some of the mortgage-backed securities has “become so complex that investors are simply uncertain about how much the securities are worth.”⁵⁵ In that case, however, the same flexible pricing approach that is used in structured financing transactions to buy financial assets of uncertain value should work in this context,⁵⁶ including the accounting considerations.⁵⁷ Mortgage-backed securities purchases also could be coupled with taking equity or contingent equity, such as warrants.⁵⁸

51. See, e.g., Deborah Solomon et al., *U.S. to Buy Stakes in Nation's Largest Banks*, WALL ST. J., Oct. 14, 2008, at A1 (“[T]he U.K., Germany, France, Spain and Italy provided further details of measures to buy stakes in struggling banks and offer lending guarantees that they launched . . .”).

52. See, e.g., *id.* (quoting Jared Bernstein of the liberal Economic Policy Institute) (“The consensus was so strong towards direct equity injections that there was literally no dissension on the point The only head-scratching is why did it take us so long to get here?”).

53. See *supra* text accompanying notes 28–30.

54. See, e.g., Schwarcz, *Disclosure's Failure*, *supra* note 1, at 9 (“[T]he very complexity of securities backed by subprime mortgages makes it difficult to assess their suitability for investment, potentially seducing individuals into seeing what they are already inclined to believe—that these securities are creditworthy.”).

55. Schwarcz, *supra* note 41; see also Schwarcz, *Disclosure's Failure*, *supra* note 1, at 9 (noting that the complexity of securities backed by subprime mortgages makes it difficult to assess their value).

56. See STEVEN L. SCHWARCZ, *STRUCTURED FINANCE: A GUIDE TO THE PRINCIPLES OF ASSET SECURITIZATION* § 4:10, at 4–29 (3d ed. supplemented through Nov. 2008) (explaining that if a buyer and seller are unsure of asset value in a structured financing transaction the seller may sell the buyer the right to collect a portion of the asset value upon resell but retain the right to collect the rest).

57. See *id.* at § 7:3, at 7–4 to 7–6 (explaining these accounting considerations) (discussing ACCOUNTING FOR TRANSFERS AND SERVICING OF FINANCIAL ASSETS AND EXTINGUISHMENTS OF LIABILITIES, Statement of Fin. Accounting Standards No. 140 (Fin. Accounting Standards Bd. 2000), available at <http://www.fasb.org/pdf/fas140.pdf>).

58. See, e.g., Schwarcz, *Disclosure's Failure*, *supra* note 1, at 9 (“[T]he very complexity of securities backed by subprime mortgages makes it difficult to assess their suitability for

The government must also consider other issues that it will face in determining the value of these mortgage-backed securities. For example,

[I]n establishing prices at which it will purchase the “troubled” mortgage-backed securities held by banks and other financial institutions, the government must insulate the price-setting process from inevitable lobbying pressure to pay more than the securities are worth. This is important not only to ensure fairness and to give taxpayers a chance to profit, but also to instill the credit markets with confidence in valuing these types of securities.⁵⁹

Buying stock avoids any accounting and potential asset write-off issues, but it raises other issues such as pricing the stock itself.⁶⁰ Buying stock also puts the government in the undesirable position of owning equity interests in private financial institutions. Nonetheless, it is critically important that the government is acting decisively. Although any bailout plan creates moral hazard,⁶¹ that is a much lower risk now than an economic depression.⁶² To date, the approach of buying stock has not been entirely successful. Among other problems, recapitalized banks have been highly reticent to make new loans.⁶³

EESA includes other provisions. For example, it permits the Secretary of the Treasury to, “[u]pon request of a financial institution . . . guarantee the timely payment of principal of, and interest on, troubled assets.”⁶⁴ It also mandates a much needed study of mark-to-market, or “fair value,” accounting.⁶⁵ The use of mark-to-market accounting “generally stabilizes financial markets by creating trust that assets are fairly valued.”⁶⁶ However, as in the subprime crisis,

investment, potentially seducing individuals into seeing what they are already inclined to believe—that these securities are creditworthy.”).

59. Schwarcz, *supra* note 41.

60. *See supra* note 54 and accompanying text.

61. *Cf. Hearing, supra* note 44, at 13 (explaining how a liquidity provider of last resort could create moral hazard and proposing methods to control such moral hazard).

62. *See, e.g., Zuckerman, supra* note 5, at 79 (arguing that not doing a bailout would “threaten[] the continuation of the economic life we know and [create] the specter of a crises even greater than the 1930s”).

63. *See, e.g., Tara Siegel Bernard, Costs and Tighter Rules Thwart Refinancings*, N.Y. TIMES, Jan. 24, 2009, at B1 (explaining that the Federal Reserve’s plan to buy up mortgage-backed securities appears to be failing as borrowers continue to face major stumbling blocks to getting loans and lenders are being more cautious in making loans).

64. Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, § 102(a)(3), 122 Stat. 3765, 3769 (to be codified at 12 U.S.C. § 5212).

65. *Id.* § 133(a), 122 Stat. at 3798 (to be codified at 12 U.S.C. § 5238).

66. *See Schwarcz, supra* note 41; *see also Schwarcz, Protecting Financial Markets, supra* note 1, at 396 (“Requiring investors to mark prices to market value in this fashion is generally believed to reduce risk.”).

it can destabilize markets when investors lose confidence during times of market turbulence “by requiring firms to sell assets to meet margin calls, which can artificially depress asset prices and cause a downward spiral.”⁶⁷ Firms then “should be allowed to substitute other measures of investor comfort” for mark-to-market, “such as allowing a [firm] otherwise required to mark-to-market to have the option, instead, to disseminate full disclosure of its underlying asset portfolio.”⁶⁸ For example, a firm that owns CDO securities should be able to choose to disclose details about the mortgage loans and other financial assets underlying those securities in lieu of marking the securities to market, thereby enabling investors and other market participants to make more transparent valuations.⁶⁹

EESA also enables the government to purchase securities to kick-start markets,⁷⁰ as it is now doing in the commercial paper market and is about to do with money market funds. Significantly for homeowners, another provision that may not have been fully appreciated when enacted, EESA also “gives the government power to stall foreclosure on mortgage loans that it purchases.”⁷¹ This may turn out to be a close “practical equivalent of amending the bankruptcy law for those homeowners; absent foreclosure, lenders and servicers will be forced to work out alternate repayment terms with the homeowners.”⁷² It is unclear, however, how this will work if neither mortgage-backed securities

67. Schwarcz, *supra* note 41; see also *supra* text accompanying notes 25–31.

68. Schwarcz, *supra* note 41; see also Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 399 (explaining how market participants lost confidence in mortgage-backed securities because they did not have enough information to accurately assess the securities’ value).

69. See Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 398 (“The indirect holding system for securities also made it very difficult to ascertain whether CDO and ABS CDO securities were held by securitization counterparties, and as long as that system continues to dominate securities holdings, this difficulty will remain.”). This approach also would help reduce the anomaly, seen during the subprime crisis, of securities bearing market values significantly lower than the present value, if known, of their reasonably expected cash flows. See *id.* at 396.

70. See Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, § 2(1), 122 Stat. 3765, 3766 (to be codified at 12 U.S.C. § 5201) (“The purposes of this Act are . . . to immediately provide authority and facilities that the Secretary of the Treasury can use to restore liquidity and stability to the financial system of the United States . . .”).

71. Schwarcz, *supra* note 41; see also Emergency Economic Stabilization Act §§ 109–10 (to be codified at 12 U.S.C. §§ 5219, 5220) (directing the Secretary of the Treasury to encourage mortgage servicers to work to minimize foreclosures and directing the Secretary to assist with loan renegotiations to avoid foreclosures).

72. Schwarcz, *supra* note 41; see also Emergency Economic Stabilization Act § 109(c) (to be codified at 12 U.S.C. §§ 5219) (requiring consent to reasonable loan modification requests). Working out the loan, rather than foreclosing, can actually increase the value of recovery to the mortgagee while allowing the homeowner to stay in his home. See Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 391–93. In this context, also consider how, if at all, the upcoming ARM resets should be treated and the impact of not treating them.

nor mortgage loans are purchased.⁷³ To the extent it does not work, the government must focus on other approaches to increase homeowner affordability.⁷⁴ Otherwise, continuing foreclosure will result in greater home value depreciation, further pulling down the real economy.⁷⁵ The plan also limits executive compensation for the top five executives of firms in which the government takes a stake, limits “golden parachutes,” and requires these firms to take a more long-term view to executive compensation.⁷⁶ Finally, if there are losses five years into the plan’s program, EESA contemplates the possibility of recouping such losses from the financial industry.⁷⁷

III. WHAT SHOULD BE DONE TO AVOID FUTURE FINANCIAL CRISES?

It is impossible to know how future financial crises will arise. Ultimately, the key to protecting against future crises is to remain open, flexible, and aware of changing circumstances. To this end, the government should take a broad and flexible approach. I have mentioned how the Federal Reserve, initially tasked to address the building financial crisis, focused almost entirely on its narrow legal mandate.⁷⁸ It may well be helpful to have a central governmental agency with a mandate to protect against financial crises of any type, including financial instability. In the United Kingdom, for example, the Financial Services Authority (FSA) is the single organization responsible for almost all financial institutions and markets;⁷⁹ several other countries have their own governmental

73. See Emergency Economic Stabilization Act §§ 109–10 (to be codified at 12 U.S.C. §§ 5219, 5220) (demonstrating that for the Federal government to have real power, beyond merely encouraging private servicers to alter loans and avoid foreclosures, the government must hold or control an interest in the mortgages).

74. Schwarcz, *supra* note 41. These ways might include, for example, amending bankruptcy law to allow judges to modify the terms of home mortgage loans.

75. See, e.g., Amilda Dymi, *Outlook: Home Value Depreciation Will Continue This Year*, NAT’L MORTGAGE NEWS, Jan. 5, 2009, <http://www.nationalmortgagenews.com/premium/archive/?id=162360> (reporting that some of the largest home value depreciations are occurring in areas with the highest foreclosure rates).

76. See Emergency Economic Stabilization Act § 111(b)(2) (to be codified at 12 U.S.C. § 5221) (giving standards for executive compensation and corporate governance of firms that sell troubled assets to the government under this Act).

77. See *id.* § 134 (to be codified at 12 U.S.C. § 5238) (explaining that five years after the enactment of the Act, the President must submit a legislative proposal for recouping any losses from the financial industry so as not to add to the deficit or national debt).

78. See *supra* text accompanying notes 32–33.

79. See Financial Services Authority, *Who We Regulate*, <http://www.fsa.gov.uk/pages/About/What/Who/index.shtml> (last visited Mar. 20, 2009) (“The FSA regulates most financial services markets, exchanges and firms.”).

equivalents of the FSA.⁸⁰ However, fully centralizing government responsibility in a single agency might itself create an unintended degree of tunnel vision. It also would reduce competition among agencies, which might lower the quality of regulation.⁸¹ Query whether it is better to have separate agencies with merely something like a centralized coordinating committee.

To protect against future crises, we also should try to learn from the nature of the fundamental failures causing the subprime crisis. In my article, *Protecting Financial Markets: Lessons from the Subprime Mortgage Meltdown*,⁸² I argued that most of the causes of the subprime financial crisis can be divided conceptually into three categories: conflicts, complacency, and complexity. These categories are broad, but they do not capture everything.

For instance, a fourth possible category of causes is cupidity. However, greed “is so ingrained in human nature and so intertwined with the other categories that it adds little insight to view it as a separate category.”⁸³ Government cannot meaningfully legislate against greed. Moreover, as Gordon Gekko famously said in the movie *Wall Street*, greed is—at least in moderation—good.⁸⁴ Jewish law recognizes, for example, that the *yetzer hara*, or evil impulse, is only problematic when yielded to in excess; in moderation, it is necessary to foster reproduction of the species and, in the commercial sector, to stimulate trade and commerce through the profit motive.⁸⁵

80. See, e.g., BaFin, Functions, http://www.bafin.de/clin_116/nn_720494/EN/BaFin/Functions/functions.html?__nnn=true (last visited Mar. 20, 2009) (explaining that Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) is the German organization charged with overseeing Germany’s financial market system).

81. See Elizabeth F. Brown, *E Pluribus Unum—Out of Many, One: Why the United States Needs a Single Financial Services Agency*, 14 U. MIAMI BUS. L. REV. 1, 100–01 (2005) (“[T]he optimal number of financial regulators in the United States is one. A single, federal financial regulator would be able to anticipate and plan for future financial crises, more carefully monitor and regulate financial conglomerates, provide better protection for consumers, operate more effectively in international negotiations, quickly adapt to market innovations and developments, be accountable for market failures, eliminate the duplicative regulations and regulatory gaps, harmonize regulations for financial products and firms competing in the market, and avoid being captured by narrow segments within the financial services industry.”).

82. See Schwarcz, *Protecting Financial Markets*, *supra* note 1.

83. *Id.* at 405–06.

84. WALL STREET (20th Century Fox 1987) (partial transcript available at <http://www.americanrhetoric.com/MovieSpeeches/moviespeechwallstreet.html> (last visited Mar. 20, 2009)) (“The point is, ladies and gentleman, that greed—for lack of a better word—is good.”).

85. See, e.g., Thomas L. Shaffer, *Jews, Christians, Lawyers, and Money*, 25 VT. L. REV. 451, 468 (2001) (citing MEIR TAMARI, *THE CHALLENGE OF WEALTH: A JEWISH PERSPECTIVE ON EARNING AND SPENDING MONEY* 158, 162–63 (1995)) (explaining that Judaism recognizes that the *yetzer hara*, the spirit of greed and lust, is needed but must be proscribed by imposing limits, such as those against hoarding or corruption).

These categories also fail to embrace the full scope of systemic risk, “whose uniqueness arises from a type of tragedy of the commons.”⁸⁶ Being that “the benefits of exploiting finite capital resources accrue to individual market participants whereas the costs of exploitation,” which affect the real economy, “are distributed among an even wider class of persons, market participants have insufficient incentive to internalize their externalities.”⁸⁷ Therefore, even in a simple financial system with no conflicts and hyper-diligent market participants, systemic risk is theoretically possible. I am not claiming that lack of incentive to take care necessarily creates systemic problems, but merely that lacking that incentive means the system is not necessarily protected and thus is more exposed to problems that undermine it. I will address this more theoretical nature of the problem of systemic risk after addressing the fundamental categories of conflicts, complacency, and complexity—which themselves can lead, as in the current financial crisis, to systemic collapse. These categories embody market failures that firms should have protected against in their own self-interest. The interesting question is why firms failed to do so.

The first category, conflicts, is the most tractable because, once identified, conflicts can often be managed.⁸⁸ For example, concerns about moral hazard resulting from the “originate-[to]-distribute model can be managed by [better] aligning the interests of mortgage lenders and investors [such as] by requiring the former to retain a risk of loss.”⁸⁹ Also, firms can manage conflicts—such as high compensation and bonuses for arranging deals or investments that later fail—in the way they pay managers by taking a more long-term view to compensation, which EESA now requires in a limited context.⁹⁰ This should be done not only for top managers but also for secondary managers, who make many important decisions regarding investments.⁹¹ Consider, however, the extent to which super-large compensation, even if a portion can be clawed back (i.e., retroactively recovered) or contingently paid over time, creates inherent conflicts. For example, if an individual’s compensation, even if it were to be fully adjusted downward, still enables that individual to be financially

86. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 406.

87. *Id.*

88. *Id.* at 404.

89. *Id.*

90. See Emergency Economic Stabilization Act of 2008, Pub. L. No. 110-343, § 111, 122 Stat. 3765, 3776 (to be codified at 12 U.S.C. § 5221) (listing standards governing salaries for executives at “[a]ny financial institution that sells troubled assets to the Secretary”). However, some conflicts “may be harder to manage in practice, such as conflicts in how rating agencies are paid.” Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 404.

91. See, e.g., Schwarcz, *Conflicts*, *supra* note 1, at 12 (“Because compensation is at the root of the conflict between firms and their secondary manager, the most effective way to align incentives is to tie secondary-manager compensation to long-term interests of the firm.”).

independent of the firm, then that individual's incentives will not necessarily be aligned with the firm's incentives.

Complacency is a more difficult category because the government cannot change human nature—although it can try to affect behavior.⁹² During a financial crisis, everyone becomes focused on the problems at hand and on how to avoid them in the future.⁹³ But once the crisis recedes from memory and investors are again making money, the experience is that investors will always “go for the gold.”⁹⁴ Professor Cowen makes essentially this same point about the subprime crisis: “The real problem is . . . that we cannot help but put the evaluation of risk into all-too-human hands.”⁹⁵ Furthermore, some forms of complacency are at least partly rational.⁹⁶ For example, some investors may realize that market prices are artificially inflated, yet they continue to buy in with the hopes of selling just before the bubble bursts—while prices are at their zenith.⁹⁷ Also, “investors will almost certainly continue to overrely on rating-agency ratings, so long as the cost of making independent credit investigations remains high.”⁹⁸

Complexity is the most difficult category. It is “increasingly a metaphor for the modern financial system and its potential for failure.”⁹⁹ In another paper, I observed that “[s]olving problems of financial complexity may well be the ultimate twenty-first century market goal.”¹⁰⁰ Complexity comes in at least two forms. First, there is “cognizant complexity”—things are just too complex to understand.¹⁰¹ This manifests itself, for example, in the difficulty of achieving transparent disclosure for complicated securities and also in the difficulty of market participants to learn the financial condition of their counterparties (due, for example, to their entering into credit-default swaps).¹⁰² Second, there is

92. See, e.g., Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 404 (“[C]omplacency, is less tractable because solutions to complacent behavior can require changing human nature, an obviously impossible task.”).

93. *Id.*

94. Cf. Larry Light, *Bondholder Beware: Value Subject to Change Without Notice*, BUS. WK., Mar. 29, 1993, at 34 (discussing that within years after the RJR Nabisco, Inc. takeover, investors favored higher interest rates over “event risk” covenants because the examples of events justifying the covenants had receded in memory). As Light noted: “Bondholders can—and will—fuss all they like. But the reality is, their options are limited: Higher returns or better protection. Most investors will continue to go for the gold.” *Id.*

95. Cowen, *supra* note 2.

96. See, e.g., Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 382 (explaining why investors who recognize a market bubble as irrational may rationally decide to buy in).

97. *Id.*

98. *Id.* at 405.

99. *Id.*

100. *Id.*

101. Schwarcz, *Complexity*, *supra* note 1, at 4.

102. *Id.*

“temporal” complexity—in a complex system, signals are sometimes inadvertently transmitted too quickly to control.¹⁰³ This manifests itself, for example, in the “tight coupling”¹⁰⁴ that causes markets to move rapidly into a crisis mode.¹⁰⁵

Consider first how to address cognizant complexity, initially addressing the failure of disclosure and then addressing the difficulty of market participants to learn the financial condition of their counterparties. For the failure of disclosure, investors can partly address this failure by demanding more and better disclosure, including disclosure of contingent liabilities.¹⁰⁶ Next, regarding the difficulty of market participants to learn the financial condition of their counterparties, there are at least two reasons for this difficulty. One reason is that it can be difficult to value a counterparty’s assets.¹⁰⁷ In the subprime crisis, this was illustrated by the difficulty in valuing the mortgage-backed securities owned by counterparties.¹⁰⁸ I have, at least in part, already discussed this difficulty.¹⁰⁹ The other reason for this difficulty is that a counterparty may have taken on undisclosed contingent liabilities.¹¹⁰ In the subprime financial crisis,

103. *Id.* at 5.

104. See Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 395 (citing RICHARD M. BOOKSTABER, A DEMON OF OUR OWN DESIGN: MARKETS, HEDGE FUNDS, AND THE PERILS OF FINANCIAL INNOVATION 144 (2007)) (adopting this term introduced by Rick Bookstaber, who originally borrowed the term from engineering nomenclature).

105. The effects of these types of complexities can combine—the cognizant complexity caused by the unexpected consequences of marking-to-market which, like a complex engineering system subject to nonlinear feedback effects, resulted in a downward death spiral of prices when marking-to-market occurred in unstable markets. See Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 396.

106. See *supra* text accompanying notes 68–69. But cf. Schwarcz, *Disclosure’s Failure*, *supra* note 1, at 16 (showing why solutions to this failure are all second best).

107. See Schwarcz, *Complexity*, *supra* note 1, at 28–30 (discussing how counterparties are interconnected and using Bear Stearns as an example to demonstrate the difficulty of valuing counterparty assets).

108. *Id.* Related to this is the difficulty in knowing even the quantity and types of investment securities held by a counterparty. *Id.*

109. See *supra* text accompanying note 28.

110. Under generally accepted accounting principles, a contingent liability only needs to be shown on a company’s balance sheet if the contingency is “probable.” ACCOUNTING FOR CONTINGENCIES, Statement of Fin. Accounting Standards No. 5, ¶¶ 8–13, at 5–7 (Fin. Accounting Standards Bd. 1975), available at <http://www.fasb.org/pdf/fas5.pdf>. Contingent liabilities must be disclosed in the footnotes to the balance sheet if the contingency is a “reasonable possibility.” *Id.* ¶ 10 (allowing only remote risks to remain undisclosed). Moreover, the Financial Accounting Standards Board requires guarantors at least to recognize on their balance sheets a liability for the fair value of the guarantee obligation. GUARANTOR’S ACCOUNTING AND DISCLOSURE REQUIREMENTS FOR GUARANTEES, INCLUDING INDIRECT GUARANTEES OF INDEBTEDNESS OF OTHERS, FASB Interpretation No. 45, ¶ 9, at 10 (Fin. Accounting Standards Bd. 2002). Finally, as authorized by the Securities Exchange Act of 1934, 15 U.S.C. 78m(j) (Supp. 2008), the SEC has

for example, one of the reasons market participants have had difficulty learning the financial condition of their counterparties is that so many firms entered into over-the-counter credit derivatives under which they bought or sold risk.¹¹¹ Although a potential future solution to this problem is to centrally register credit-derivative transactions,¹¹² I am skeptical of the solution's efficacy because, as I will discuss, the chameleon-like nature of derivatives makes it difficult to determine what constitutes a credit derivative, and thus what should be required to be registered.¹¹³

Next, consider how to address temporal complexity, where signals are inadvertently transmitted too quickly to control. To address temporal complexity, we need to loosen the tight coupling that causes markets to move rapidly into a crisis mode. I have argued that this can be done by a governmental or other entity acting as the equivalent of a "market liquidity provider of last resort" to help stabilize irrationally panicked markets by purchasing securities.¹¹⁴ This type of targeted market investment should generate relatively minimal costs, and certainly lower costs than those of a "lender of last resort" to financial institutions—the Federal Reserve's traditional role.¹¹⁵

When a lender of last resort provides a lifeline to financial institutions, it "fosters moral hazard by potentially encouraging these institutions—especially those that believe they are 'too big to fail'—to be fiscally reckless. . . . [I]oans made to these institutions will not be repaid if the institutions eventually fail."¹¹⁶ A market liquidity provider, in contrast, "*especially if it acts at the outset of a market panic,*"¹¹⁷ may invest profitably "in securities at a deep discount from the market price and still provide a 'floor' to how low the market will drop."¹¹⁸

promulgated 17 C.F.R. § 229.303(a)(4)(i)(C) (2008), which requires disclosure of contingent liabilities that are "reasonably likely to become material."

111. See *infra* text accompanying notes 135–55.

112. See, e.g., Christopher Cox, Op-Ed., *Swapping Secrecy for Transparency*, N.Y. TIMES, Oct. 19, 2008, at WK12 ("Congress could require that dealers in over-the-counter credit-default swaps publicly report both their trades and the value of those trades.").

113. See *infra* text accompanying notes 138–55.

114. Schwarcz, *Complexity*, *supra* note 1, at 43. Markets normally can fluctuate widely. I am contemplating action only when, in an irrationally panicked market, the market price of securities is falling substantially below their intrinsic value, see *id.* at 44, the latter determined, in the case of asset-backed securities for example, by present valuing an estimate of the expected value of cash flows from obligors. See Simon Gervais & Steven L. Schwarcz, *Valuation of Risky Cash Flows* (working paper on file with author); *infra* note 156 and accompanying text.

115. See Schwarcz, *Complexity*, *supra* note 1, at 47; *supra* text accompanying note 34.

116. See Schwarcz, *Complexity*, *supra* note 1, at 48–49.

117. *Id.* at 49 (emphasis added). The mechanics of timing purchases will be critical. The market liquidity should be careful not to act, however, when price fluctuations are normal. See *supra* note 114 and accompanying text.

118. Schwarcz, *Complexity*, *supra* note 1, at 49.

Buying at a deep discount will mitigate moral hazard and also make it likely that the market liquidity provider will be repaid.¹¹⁹ Such a market liquidity provider is needed because, in a panicked market, private investors may not act rationally.¹²⁰ Furthermore, private institutional investors usually want to buy and sell securities—not wait for them to mature. An investor who knows that the market price of securities has fallen below its intrinsic value may not want to risk having to wait until maturity of the securities to profit, especially if the market value of the securities is still falling.¹²¹ A governmental market liquidity provider, however, should be able to wait until maturity, if necessary.¹²²

Next consider the more theoretical nature of the problem of systemic risk. Recall that “[b]ecause the benefits of exploiting finite capital resources accrue to individual market participants whereas the costs of exploitation are distributed among an even wider class of persons, market participants have insufficient incentive to internalize their externalities.”¹²³ These are externalities that firms, out of self-interest, should not necessarily protect against. Therefore, even if market participants fully understand that incurring certain risks may contribute to systemic risk, they will not be motivated, absent regulation, to internalize those risks.¹²⁴ Conceptually, therefore, the solution to systemic risk is to impose regulation that internalizes those externalities.¹²⁵

It is unclear, however, what regulation can do to require market participants to internalize all of their externalities because of the myriad of ways in which externalities can arise.¹²⁶ In the subprime crisis, for example, “imposing ‘suitability’ requirements on mortgage loans and otherwise restricting ‘predatory’ lending” may have helped to internalize externalities.¹²⁷ However, these restrictions almost certainly will not address the next crisis.¹²⁸ Similarly, making mortgage lending safer, such as imposing the equivalent of margin regulations (i.e., minimum collateral coverage) on mortgage loans—a

119. See Schwarcz, *Systemic Risk*, *supra* note 1, at 229.

120. See *supra* text accompanying notes 96–113.

121. See Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 396.

122. See *id.* at 406 (concluding that private investors have little incentive to invest in troubled securities and that a liquidity provider is therefore needed to “mitigate market instability”); Schwarcz, *Systemic Risk*, *supra* note 1, at 229 (explaining that a liquidity provider is immune to the herd behavior that prevents private investors from investing in troubled assets).

123. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 406.

124. See, e.g., *id.* at 386 (“Investors are . . . unlikely to care about disclosure to the extent it pertains to systemic risk.”).

125. See, e.g., Schwarcz, *Systemic Risk*, *supra* note 1, at 206 (“Without regulation, the externalities caused by systemic risk would not be prevented or internalized . . .”).

126. Schwarcz, *Markets*, *supra* note 1, at 214 (quoting Eduardo Porter, *Shanghai What-If: How a Shock Can Become a Shock Wave*, N.Y. TIMES, Mar. 4, 2007, at WK3).

127. *Id.*

128. *Id.*

regulatory approach imposed by the Federal Reserve under Regulations G,¹²⁹ U,¹³⁰ T,¹³¹ and X¹³² in response to the Great Depression¹³³—would have addressed the subprime crisis, but they would have had the unintended consequence of making the cost of housing more expensive.¹³⁴

Another way that market participants may have created externalities in the subprime crisis was by entering into over-the-counter credit derivatives,¹³⁵ such as credit default swaps under which credit risk is bought and sold.¹³⁶ These swaps reduced transparency, thereby increasing the appearance, if not the actuality, of counterparty risk by dispersing credit risk contractually without a central place to ascertain how the risk was ultimately allocated.¹³⁷ The obvious regulatory solution is to require that parties to these types of derivatives transactions, or intermediaries for those parties, keep a registry of the transactions from which market participants can ascertain risk allocation.¹³⁸ Any such solution, however, would be imperfect. Derivatives are chameleon-like, in that they easily can change form and appearance, and there are a myriad of ways that risk can be transferred in transactions not regarded as derivatives, such as a simple guarantee for payment of a fee.¹³⁹ Any regulation of credit

129. 12 C.F.R. § 207 (2008).

130. *Id.* § 220.

131. *Id.* § 221.

132. *Id.* § 224.

133. In the Great Depression, collapsing stock prices caused margin loans to become undercollateralized, which caused borrowers to default, which caused banks to default, which in turn caused systemic chains of bank failures.

134. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 390 (“Imposing a minimum real-estate-value-to-loan overcollateralization on all mortgage loans secured by the real estate financed would likewise protect against a repeat of the subprime mortgage problem. Unfortunately, though, it would have a high price, potentially impeding and increasing the cost of home ownership and imposing an administrative burden on lenders and government monitors.”).

135. Over-the-counter simply means that market participants entered into these derivatives contractually and not on an exchange.

136. In a credit default swap, one party (the credit seller) agrees, in exchange for the payment to it of a fee by a second party (the credit buyer), to assume the credit risk of certain debt obligations of a specified borrower or other obligor. *See* SCHWARCZ, *supra* note 56, at § 10:1.1, at 10–5. If a “credit event” (for example, default or bankruptcy) occurs in respect of that obligor, the credit seller will either (a) pay the credit buyer an amount calculated by reference to post default value of the debt obligations or (b) buy the debt obligations (or other eligible debt obligations of the obligor) for their full face value from the credit buyer. *Id.*

137. *See* Cox, *supra* note 112 (“There is no public disclosure nor any legal requirement for these contracts to be reported to the Securities and Exchange Commission or any other agency. So government regulators have had no way to assess how much risk is in the system, whether credit-default swaps have been accurately valued or honestly traded, and when people issuing and trading them have taken on risk that threatens others.”).

138. *See supra* text accompanying note 112.

139. *See* 11 U.S.C. § 101(53B) (2006) (defining a “swap agreement”). Even a simple loan agreement can be characterized as a credit derivative.

derivatives therefore will have to grapple with the problem of defining what is being regulated, with a narrow focus potentially omitting risk transfers that should be covered and a broad focus potentially being overly restrictive by including traditional commercial transactions. Regulation also should recognize that risk transfer is not inherently bad. It can maximize efficiency if risk is transferred to parties better able to bear the risk—a goal that unregulated markets should achieve.¹⁴⁰ I am nonetheless concerned whether, in the subprime crisis, the degree of risk dispersion has created a type of collective-action problem: the ultimate risk-bearing parties do not always have sufficient amounts at risk regarding any given underlying credit risk to motivate them to engage in due diligence.¹⁴¹

Market participants also may have created externalities by incurring too much debt because the liquidity glut that preceded the subprime crisis gave firms incentives to borrow at low cost.¹⁴² High leverage fosters systemic risk—and hence externalities—by making it more likely that a firm will fail, thereby triggering failures of other highly-leveraged counterparty firms.¹⁴³ Regulating leverage could create significant costs, however. To an extent, some leverage is beneficial, “though there is no optimal across-the-board amount of leverage that is right for every company.”¹⁴⁴ Therefore, “Regulation that attempts to track optimal leverage thus would be nuanced and highly complex, as illustrated by the complexity of the Basel II capital adequacy requirements.”¹⁴⁵ The Basel II capital adequacy requirements, “designed to reduce the leverage of banks, mandate that banks hold minimum amounts of capital as a function of the riskiness of their assets.”¹⁴⁶ However, it has been observed that “the advanced

140. See PRESIDENT’S WORKING GROUP ON FIN. MKTS., HEDGE FUNDS, LEVERAGE, AND THE LESSONS OF LONG-TERM CAPITAL MANAGEMENT 25 (1999), available at <http://www.treas.gov/press/releases/reports/hedgfund.pdf> (finding that “private counterparty discipline” should prevent parties from incurring excessive risk).

141. Schwarcz, *Protecting Financial Markets*, *supra* note 1, at 381 (arguing that investors failed to exercise due diligence in assessing the value of complex asset-backed securities, collateralized debt obligations, and ABS CDO securities because the costs outweighed the apparent benefits for individual investors).

142. See *supra* text accompanying note 20.

143. See, e.g., Schwarcz, *Systemic Risk*, *supra* note 1, at 224 (explaining that highly leveraged institutions may be unable to pay their debts, which may in turn cause them to default and fail).

144. *Id.*

145. See Schwarcz, *Systemic Risk*, *supra* note 1, at 224.

146. *Id.*; see BASEL COMM. ON BANKING SUPERVISION, BANK FOR INT’L SETTLEMENTS, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS 2–5 (2006), available at <http://www.bis.org/publ/bcbs128.pdf>. Other than as discussed above, I am specifically not engaging in the debates as to whether banks need enhanced capital and reserve requirements and whether non-deposit taking financial institutions that perform financial intermediary functions (“near banks”) should be subjected to capital or reserve requirements.

approaches of Basel II are “too complex” for anyone to understand, and the mathematical formulas in various drafts of the framework can look like a foreign language to some readers.”¹⁴⁷ Furthermore, “[i]mposing unannounced [sic] limitations on leverage . . . could impair a firm’s ability to operate efficiently and impede economic growth.”¹⁴⁸

Absent effective means to avoid systemic risk by requiring market participants to internalize externalities, there still may be a pragmatic way to mitigate the likelihood of systemic collapse. Systemic collapses result from a chain of defaults;¹⁴⁹ if the chain can be broken, the defaults will not be transmitted. A liquidity provider of last resort can break the chain of defaults. The Federal Reserve traditionally has acted as such a liquidity provider to banks and other financial institutions to break the chain of institutional defaults.¹⁵⁰ In contrast, a *market* liquidity provider of last resort, much along the lines previously discussed,¹⁵¹ can break the chain of financial market defaults by stabilizing irrationally panicked markets.¹⁵² Consider how such a market liquidity provider of last resort could have helped to avoid the subprime mortgage meltdown. Once the market liquidity provider recognized that panic was causing the market prices of mortgage-backed securities to fall materially below the level of their intrinsic value,¹⁵³ the market liquidity provider could have stepped in to purchase sufficient quantities of those securities to stabilize the mortgage-backed securities markets.¹⁵⁴ Even though the stabilized price

147. Schwarcz, *Systemic Risk*, *supra* note 1, at 224 (internal quotation marks omitted) (quoting Susan Schmidt Bies, Governor, Bd. of Governors of the Fed. Reserve Sys., Basel II Developments in the United States, Remarks Before the Institute of International Bankers (Sept. 26, 2005), available at <http://www.federalreserve.gov/boarddocs/speeches/2005/20050926/default.htm>).

148. *Id.* Of course, the trick “will be trying to find a simple way of determining the appropriate maximum amount of leverage for different types of companies—in each case a maximum that neither impairs the companies’ ability to operate efficiently nor impedes economic growth.” *Id.* at 239.

149. *Id.* at 224.

150. See *supra* text accompanying note 34.

151. See *supra* notes 114–22 and accompanying text.

152. Schwarcz, *Systemic Risk*, *supra* note 1, at 225–30, 239–42; see also Schwarcz, *Complexity*, *supra* note 1, at 43–44 (discussing using modularity to reduce danger from complex systems) (citations omitted).

153. This became apparent to me at the beginning of July 2008, based on my work as an expert witness in the London Chancery Court involving a failed structured investment vehicle. See *Bank of N.Y. v. Mont. Bd. of Invs.*, [2008] EWHC 1584 (Ch.). Market observers presumably would have noticed this even earlier.

154. See Schwarcz, *Systemic Risk*, *supra* note 1, at 225 (citing Michael D. Bordo et al., *Real Versus Pseudo-International Systemic Risk: Some Lessons from History* 19 (Nat’l Bureau of Econ. Research, Working Paper No. 5371, 1995), available at <http://www.nber.org/papers/w5371.pdf> (explaining that panic, when lenders lack resources to extend loans, will usually not become contagious when a lender of last resort provides adequate liquidity). Although I talk about

would be deeply discounted from the intrinsic value of those securities, it still would be much higher than prices in a collapsed market.¹⁵⁵

For example, if the intrinsic price—essentially the present value of the expected value of the cash flows on the mortgage-backed securities¹⁵⁶—was, say, eighty cents on the dollar, and the market price had fallen to, say, fifty cents on the dollar, the market liquidity provider could purchase these securities at seventy cents on the dollar, thereby stabilizing the market and still making a profit.¹⁵⁷

Failed governmental efforts to try to control their currency exchange rates¹⁵⁸ might raise concerns about whether a market liquidity provider, even if governmental, would have sufficient spending power to stabilize irrationally panicked debt markets. Only Hong Kong was able to control its currency exchange rate, and that was because its reserves, which implicitly included all of China's reserves, were large enough to be credible.¹⁵⁹ There are important distinctions, though, between controlling a currency exchange rate and

purchasing securities, the concept of a market liquidity provider is not necessarily tied to actual purchases. There may well be alternative market liquidity approaches. My colleague Professor Bill Brown and I are currently exploring the possibility of the market liquidity provider taking a more targeted approach to stabilizing panicked markets by entering into derivative contracts to strip out the elements that the market has the greatest difficulty hedging.

155. Schwarcz, *Systemic Risk*, *supra* note 1, at 229 n.225. In the subprime mortgage meltdown, at least a portion of the mortgage-backed securities markets, including those for ABS CDO securities, were privately-placed debt markets. *See, e.g.*, Schwarcz, *Complexity*, *supra* note 1, at 10 (describing how special purpose vehicles derive payments on mortgage-backed securities principally from the underlying loans). These thin markets might not react responsively to a market liquidity provider's purchases. Nonetheless, there was a virtual market for ABS CDO securities, created by the ABX.HE indices. This virtual market was sufficiently large that it should have reacted responsively to purchases made by a market liquidity provider. The ABX.HE indices simulate the risk and reward of trading in asset- and mortgage-backed securities. *Id.* A potential investor, for example, can decide to invest in asset-backed securities represented by one of the indices, without actually purchasing the underlying securities. The investor is thus not limited to specific securities or to amounts of those securities that are actually physically available for purchase. The ABX.HE indices also help to facilitate hedging. A lender, dealer, or hedge fund with excessive asset-backed securities exposure, for example, not only can attempt to buy protection from counterparties but now can also hedge its exposure through the indices.

156. This amount could be estimated, as was done in the London Chancery Court case in which I served as an expert witness, by examining the mortgage loans underlying the securities and ascertaining which were subprime, prime, and delinquent or in default. *See Bank of N.Y.*, [2008] EWHC at 1584; *supra* note 153.

157. The U.S. Treasury's Fall 2008 purchases of mortgage-backed securities issued by Fannie Mae and Freddie Mac illustrated this potential, driving down thirty-year fixed mortgage rates a full percentage point and creating a refinancing boom. Eric Dash & Vikas Bajaj, *In 2009, Economy Will Depend on Unlocking Credit*, N.Y. TIMES, Dec. 31, 2008, at B1.

158. *See, e.g.*, Bordo et al., *supra* note 154, at 23–26 (describing currency crises in various countries and governmental efforts to handle those crises).

159. *See id.*

stabilizing an irrationally panicked debt market. Controlling a currency exchange rate depends on all of the macroeconomic factors to which the country in question is subject, whereas stabilizing a panicked debt market depends mostly on factors specific to the debt securities in question.¹⁶⁰ Also, the market liquidity provider should consider acting only when a panicked debt market is so irrational that the market value of its securities is significantly below their intrinsic value.¹⁶¹ Therefore, the market liquidity provider should be able to stem the information asymmetry leading to this valuation differential by explaining the irrationality and, by buying at an above-market price, putting its money where its mouth is. It effectively would be providing to investors in that debt market the same type of real credibility and comfort that a country's large reserves provide to currency investors.¹⁶²

In the subprime crisis, however, by ignoring the collapse of the debt markets for so long, we may have already gone beyond a tipping point in the ability of market purchases alone to correct the problem and, therefore, must also focus on resolving counterparty risk. This is because market prices have collapsed so low that banks and other financial institutions—forced to write down the value of their debt securities portfolios to market prices—appear inadequately capitalized, creating the counterparty risk.¹⁶³ That, in turn, has virtually shut down the credit markets, and the diminished credit is harming the real economy because firms need credit to operate and grow. Even worse, in a feedback loop, the crashing real economy makes it more likely that obligors on assets underlying the debt securities will default. This risk of default feeds back into lower market prices, which in turn further reduces credit, and which in turn further harms the real economy.¹⁶⁴ Our job now is to regain confidence to escape this feedback loop.

160. *Cf. supra* note 46 and accompanying text (discussing methods for determining the intrinsic value of troubled stock).

161. *See supra* note 114 and accompanying text.

162. Any analogy of a market liquidity provider to the Bank of Japan's failed attempt to support the Tokyo Stock Exchange's Nikkei index would also be inappropriate. The Nikkei is an index of shares of 225 companies selected to be representative of the Tokyo Stock Exchange as a whole, and thus the price of those shares turns on a multitude of macroeconomic factors, including Japan's financial condition. *See generally* Michael S. Bennett & Michael J. Marin, *The Casablanca Paradigm: Regulatory Risk in the Asian Financial Derivatives Markets*, 5 STAN. J.L. BUS. & FIN., Autumn 1999, at 1, 4 n.19 (explaining how the Nikkei 225 operates).

163. *See* Schwarcz, *Complexity*, *supra* note 1, at 36–38 (explaining that because generally accepted accounting principles require disclosures of certain debts and contingent liabilities, one must make judgment calls on how likely a contingency is to occur, which could result in over- or under-pricing of counterparty risk).

164. *See* GLOBAL FINANCIAL STABILITY REPORT, *supra* note 22 (discussing the effect that defaults on mortgage payments had on stock prices).

Long term, to help address and solve capital-market problems, we need fresh, unbiased ideas from an advisory group, or “brain trust” of scholars who have been studying these markets, as well as from experts with real-life market experience. Past knowledge is insufficient. For example, much of the present market crisis is tied to increasing market complexity which causes (like a complex engineering system subject to nonlinear feedback effects) unexpected consequences from otherwise routine and desirable actions—such as the downward death spiral of marking to market.¹⁶⁵ And the very nature of modern financial markets, which causes events to move rapidly into crisis mode with little time or opportunity to intervene, amplifies these unexpected consequences.¹⁶⁶ Such a brain trust “could function, formally or otherwise, by having access to government regulators at all levels and branches.”¹⁶⁷ Members of the group would “suggest ideas and critique proposed government actions.”¹⁶⁸

President Roosevelt took a similar approach in response to the Great Depression.¹⁶⁹ One difference, though, is that because financial markets cross national borders, any brain trust should include at least some foreign experts in addition to Americans.¹⁷⁰ If the government attempts to solve financial crises without this type of critical input, I fear that the solutions will continue to be makeshift, illusory, and costly. At the end of the day, we should be careful not to overregulate or micromanage markets, lest our markets lose their competitive edge.

165. See Schwarcz, *Complexity*, *supra* note 1, at 63.

166. *Id.*

167. Interview by the Duke Univ. Office of News & Commc'ns with Steven L. Schwarcz, Stanley A. Star Professor of Law & Bus., Duke Univ., in Durham, N.C. (Sept. 24, 2008), *available at* http://news.duke.edu/2008/09/braintrust_tip.html.

168. *Id.*

169. See Interview with Steven L. Schwarcz, *supra* note 167; see also Note, *The Political Activity of Think Tanks: The Case for Mandatory Contributor Disclosure*, 115 HARV. L. REV. 1502, 1503 (2002) (describing Franklin Roosevelt's Brain Trust as an informal think tank) (citing JAMES ALLEN SMITH, *THE IDEA BROKERS: THINK TANKS AND THE RISE OF THE NEW POLICY ELITE* 52, 54 (1991)).

170. Interview with Steven L. Schwarcz, *supra* note 167.