

**THE SEVEN DEADLY SINS OF THE CONTEMPORARY
FINANCIAL SYSTEM**

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Abstract

This paper identifies and analyzes the fundamental deficiencies, or “Seven Deadly Sins” of the contemporary financial system. The “Sins” are: dominance of an excessive risk-taking culture and behavior, over-reliance on short-term funding, inevitable deficiencies in hedging tools, ignorance of the sources and feedback loops of shadow banking activities, failure to address cognitive bias, over-emphasis on the use of complex regulations, and failure to promote moral restraint and professional standards. An understanding of these sins, together with a brief review of post-crisis reforms, enables policymakers to identify areas where more regulatory effort is needed, or to channel greater market power into the remediation of these fundamental deficiencies.

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I. Introduction

We are often eager to prescribe treatment before we fully understand the illness. However, legislative or regulatory exuberance in financial regulation can be highly detrimental. Modern financial markets operate like a complex adaptive ecosystem. Moreover, like an

ecosystem, policy or regulatory change is often influenced by complexity science elements, such as nonlinearity or emergence.¹

This means that regulatory efforts intended to affect market actors' behaviors may lead to an unexpected outcome, or steer them in an unintended direction.² It also means that appropriate rules for the financial ecosystem are more likely to be discovered by market participants—rather than by those who oversee the market.³ These features underscore the paramount importance of policymakers being prudent in promulgating rules and regulations. Exercising the necessary level of prudence requires an intimate understanding of the fundamental weaknesses in today's financial system.

¹ Treating the financial market as a complex system is by no means a novel idea. Indeed, such an analogy began to gain popularity in the aftermath of the 2008 global financial crisis. For instance, in 2010, the British Government Office for Science published a review that observes that “the global financial markets have become a complex adaptive ultra-large-scale socio-technical system-of-systems.” DAVE CLIFF & LINDA NORTHP, GOV'T OFF. FOR SCI., *THE GLOBAL FINANCIAL MARKETS: AN ULTRA-LARGE SCALE SYSTEMS PERSPECTIVE* 4 (2010) (U.K.); see also Lawrence G. Baxter, *Internationalisation of Law—The ‘Complex’ Case of Bank Regulation*, in *THE INTERNATIONALISATION OF LAW: LEGISLATING, DECISION-MAKING, PRACTICE AND EDUCATION* 3 (Mary Hiscock & William van Caenegem eds., 2010); Andrew G. Haldane & Robert M. May, *Systemic Risk in Banking Ecosystems*, 469 *NATURE* 351, 351–55 (2011). Another way to observe the financial system is to view it as “law-related systems.” As explained by Iman Anabtawi and Steven L. Schwarcz, “a system incorporates elements, interconnections, and functions. Further, a law-related system is a particular type of system in which law is an integral element.” Iman Anabtawi & Steven L. Schwarcz, *Regulating Ex Post: How Law Can Address the Inevitability of Financial Failure*, 92 *TEX. L. REV.* 75, 75–86 (2013).

² This feature is generally referred to by complexity theorists as “nonlinearity.” It perceives complex adaptive systems as nonlinear systems, and denotes the behavior of these systems cannot be explained in the mechanical, reductionist linear manner. Rather, these systems are nonlinear ones in which “the whole is different from the sum of its parts.” Baxter, *supra* note 1, at 14 n.95.

³ This is often referred to by complexity theorists as “emergence” or another commonly understood term, “spontaneous order.” Norman Barry, *The Tradition of Spontaneous Order*, 5 *LITERATURE OF LIBERTY* 7, 11 (1982); see also J. Barkley Rosser, Jr., *Emergence and Complexity in Austrian Economics*, 84 *J. ECON. BEHAV. & ORG.* 122, 122–23 (2012).

When it comes to analyzing fundamental illnesses, one must distinguish what exposes the financial system to *specific deficiencies* (or syndromes), and what exposes it to *general vulnerabilities*. Identification of the former informs policymakers of the *specific areas* where regulatory efforts should be directed. Understanding the latter facilitates rules of thumb that enable policymakers to identify circumstances that require regulatory intervention. This paper provides a comprehensive diagnosis of the fundamental deficiencies of today's financial system. This paper does not aim to prescribe solutions or suggest reform, but to help policymakers identify the underdeveloped areas of their respective regulatory regimes.

Section II presents a brief analysis of the common causes of financial market failures and boom-and-bust cycles. Its purpose is to provide an overview of the general vulnerabilities of modern financial markets. Section III introduces and analyzes the "Seven Deadly Sins" in today's financial system—that is, the seven major types of deficiency the author believes contributed to the 2008 global financial crisis (GFC) and remain relevant today. The Seven Deadly Sins are: (1) dominance of an excessive risk-taking culture and behavior, (2) over-reliance on short-term funding, (3) inevitable deficiencies in hedging tools, (4) ignorance of the sources and feedback loops of shadow banking activities, (5) failure to address cognitive bias, (6) over-emphasis on the use of complex regulations, and (7) failure to promote moral restraint and professional standards. Section IV reviews post-crisis regulatory developments and highlights areas for improving regulations. Section V reaffirms the paper's key conclusions.

II. Market Failures and Cycles of Boom-and-Bust

This Section addresses types of market failures and their causes, as well as analyzes boom-and-bust cycles. Most of the concepts are conventional wisdom, but a review helps us understand the common vulnerabilities facing the different segments of the contemporary financial markets. Lessons learned from this brief analysis can then be further incorporated into our examination of the Seven Deadly Sins.

A. Types and Causes of Market Failures

Market failures not only hinder the maximization of economic efficiency, but also justify financial regulation.⁴ Such regulations are implemented to promote economic efficiency by correcting market failures.⁵ Market failures vary in accordance with the particular taxonomy used, but four types are commonly identified: information failure, agency failure, rationality failure, and externalities/responsibility failure.⁶

B. Information Failure

Information failure generally occurs in two situations. First, when some participants in a transaction do not have perfect and unbiased information.⁷ Second, when one party in a transaction has less complete and accurate information than the other.⁸ This is referred to as “information asymmetry.”⁹ Asymmetric information undermines the pricing mechanism of the market, and raises two significant problems: adverse selection and moral hazard.¹⁰

Firstly, the price of a financial product is normally determined by the rational calculations of two well-informed parties to a transaction.¹¹ Relevant factors include the possibility of default, projected profits, the cost of capital, and the alternatives available.¹² All financial products require a substantial investment of time in obtaining and

⁴ See Steven L. Schwarcz, *Systemic Risk*, 97 GEO. L. J. 193, 206–07 (2008).

⁵ See DAVID GOWLAND, *THE REGULATION OF FINANCIAL MARKETS IN THE 1990S* 21 (1990).

⁶ This taxonomy is adopted by Steven Schwarcz. See Steven L. Schwarcz, *Controlling Financial Chaos: The Power and Limits of Law*, 3 WIS. L. REV. 815, 818–25 (2012).

⁷ *Information Failure*, ECONOMICS ONLINE, http://www.economicsonline.co.uk/Market_failures/Information_failure.html [<https://perma.cc/5DLF-PBLH>].

⁸ *Id.*

⁹ *Id.*

¹⁰ HEIDI MANDANIS SCHOONER & MICHAEL W. TAYLOR, *GLOBAL BANK REGULATION: PRINCIPLES AND POLICIES* 300 (2010).

¹¹ See *Information Failure*, *supra* note 7.

¹² See Ryan C. Fuhrmann, *How Banks Set Interest Rates on Your Loans*, INVESTOPEDIA (Sept. 19, 2017), <https://www.investopedia.com/articles/investing/080713/how-banks-set-interest-rates-your-loans.asp> [<https://perma.cc/FHQ6-7WFJ>].

analyzing relevant information, or honest and unreserved disclosure by both sides.¹³ It is impossible to reach an optimal price if the information presented is asymmetric.

Adverse selection is the phenomenon whereby the “parties who are most likely to produce an undesirable outcome are the ones most likely to be selected.”¹⁴ For example, those eager to pay a higher premium for a bank loan are more likely to not pay it back.¹⁵ Likewise, banks willing to pay higher interest to attract depositors are likely to be those with dubious integrity.¹⁶ This situation arises because the information available to one side is insufficient for making informed decisions that are not overly reliant on the interest rate or premium being offered.¹⁷

Secondly, “moral hazard” describes the consequences that result from a failure of the principal-agent relationship or an incentive shortcoming.¹⁸ Moral hazard in the context of information asymmetry may occur if the party who has more information is incentivized to act to the detriment of the other party.¹⁹ For instance, once a loan is given, the lender is subject to the hazard that the borrower may engage in activities which make it less likely the loan will be repaid.²⁰ Information asymmetry is not the direct cause of moral hazard, but incentive failure is.²¹ Nevertheless, information asymmetry renders the problem of moral hazard much more complex and difficult to fix, as it requires scrupulous monitoring by the party with less information.²²

The causes of information failure in today’s financial markets are generally threefold: the growing complexity of financial

¹³ See *Information Failure*, *supra* note 7.

¹⁴ See SCHOONER & TAYLOR, *supra* note 10, at 301.

¹⁵ *Id.*

¹⁶ See *id.* at 302.

¹⁷ See *id.* at 301–02 (discussing how asymmetrical information in the market leads to a “lemons problem” whereby informational asymmetry causes inaccurate value assessments and, consequently, market inefficiency).

¹⁸ For an overview of moral hazard in the context of banking, see generally Thomas F. Hellmann, Kevin C. Murdock, & Joseph E. Stiglitz, *Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough?*, 90 AM. ECON. REV. 147 (2000).

¹⁹ See SCHOONER & TAYLOR, *supra* note 10, at 302.

²⁰ See *id.*

²¹ See *id.*

²² See *id.*

products,²³ the inherent lack of sophistication of retail investors,²⁴ and the substantial transaction costs of obtaining and analyzing information.²⁵ Firstly, complex financial products appear ubiquitous in the financial markets.²⁶ Products that entail “securitization” “structured finance,” and “derivatives” confuse not only retail investors, but sometimes even those who sell them.²⁷ Gaining a full understanding of the complex structures of these products often requires sophisticated mathematical skills, and sometimes even a level of intelligence associated with data science²⁸ or rocket science.²⁹ This leads us to the second cause of information failure: retail investors’ lack of sophistication.³⁰ Not everyone has the knowledge and ability to fully comprehend the differences between the myriad of financial products.³¹ That is why we rely heavily on investment advisors or fund managers.³² Reliance on financial experts demonstrates the fact that

²³ Schwarcz, *supra* note 6, at 818.

²⁴ See Kristina Zucchi, *What is the Difference Between Institutional Traders and Retail Traders*, INVESTOPEDIA (Mar. 5, 2015), <https://www.investopedia.com/articles/active-trading/030515/what-difference-between-institutional-traders-and-retail-traders.asp> [<https://perma.cc/7Q4T-QH9C>].

²⁵ Schwarcz, *supra* note 6, at 819–20.

²⁶ See Steven L. Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 213–14 (2009).

²⁷ See Schwarcz, *supra* note 6, at 818–19 (“Although most, if not all, of the risks on complex mortgage-backed securities were disclosed prior to the 2008 financial crisis, many institutional investors—including even the largest, most sophisticated firms—bought these securities without fully understanding them.”). Similar concern has been expressed by scholars on the buyers’ side. See Steven L. Schwarcz, *Disclosure’s Failure in the Subprime Mortgage Crisis*, 2008 UTAH L. REV. 1109, 1110 (2008) (“Thus, a lot of institutional investors bought [the subprime mortgage-backed] securities substantially based on their ratings [without fully understanding what they bought], in part because the market has become so complex.”).

²⁸ See Ivan Levingston & Taylor Hall, *New Breed of Super Quants at NYU Prep for Wall Street*, BLOOMBERG (Aug. 22, 2017, 8:32 AM), <https://www.bloomberg.com/news/articles/2017-08-22/wall-street-s-hunger-for-data-scientists-fed-by-new-nyu-ph-ds> [<https://perma.cc/Z966-NSE2>].

²⁹ See Evan Davis, *The Rocket Scientists of Finance*, BBC News (Jan. 14, 2009), [news.bbc.co.uk/2/hi/business/7826431.stm](https://www.bbc.co.uk/2/hi/business/7826431.stm) [<https://perma.cc/4BJ6-2QLQ>].

³⁰ See SCHOONER & TAYLOR, *supra* note 10, at 300–01.

³¹ See *id.* at 301.

³² See *id.*

information is indeed asymmetric. Obtaining and analyzing information is costly and requires a considerable investment of time and fiscal resources.³³ A lack of either exacerbates information asymmetry.

C. Agency Failure

Agency failure, also called principal-agent failure, arises when the agent and principal are motivated by conflicting incentives, and each acts according to their own, sometimes incompatible, interests.³⁴ Agency failure is widespread in finance. It exists between shareholders and managers of banks, between retail investors and fund managers, and even “between [secondary] managers and the senior managers to whom they report.”³⁵ Agency failure is a form of incentive failure, but its application is limited to the trust relationship between principal and agent.³⁶ Agency failure occurs when an agent deviates from their fiduciary duty to their principal, and has the potential to destroy public trust and confidence in the financial industry.³⁷

The main cause of agency failure is widely considered to be the inherently contradictory incentive structure between agents and principals.³⁸ Another is information asymmetry.³⁹ In general, agents tend to have more information than principals.⁴⁰ Principals entrust agents with privileges and powers mainly because they lack sufficient time or expertise to conduct day-to-day business operations or make sophisticated investment decisions.⁴¹ This asymmetric information advantage enables agents to pursue their own interests unbeknownst to

³³ See Schwarcz, *supra* note 27, at 1114.

³⁴ For a comprehensive overview of conflicts of interests introduced by principal-agent failure, see Iman Anabtawi & Steven L. Schwarcz, *Regulating Systemic Risk: Towards an Analytical Framework*, 86 NOTRE DAME L. REV. 1349, 1364–66 (2011).

³⁵ Schwarcz, *infra* note 61, at 1790–91; see also Schwarcz, *infra* note 42.

³⁶ See *Information Failure*, *supra* note 7.

³⁷ See *id.*

³⁸ See Anabtawi & Schwarcz, *supra* note 34, at 1364 (“[C]ompensation schemes provide managers with incentives to run their firms differently from the way shareholders would like.”).

³⁹ Schwarcz, *infra* note 61, at 1788.

⁴⁰ See *Information Failure*, *supra* note 7.

⁴¹ See *id.*

their principals, potentially exacerbating agency costs for the broader market.⁴²

D. Rationality Failure

Rationality failure, often described by behavioral economists as ‘behavioral bias,’ refers to the reality that human beings make decisions directed by cognitive bias and bounded rationality—and not by rational calculation.⁴³ Although a type of informational failure, its incorporation of the psychology, sociology, and neuroscience behind human decision-making renders it deserving of its own category.⁴⁴ Behavioral biases are well-documented and backed by empirical evidence.⁴⁵ Among the most detrimental are complacency⁴⁶ and over-reliance on heuristics.⁴⁷ Complacency encompasses “biases that induce decisionmakers to place undue confidence in, or attribute erroneous distributional properties to unrepresentative samples.”⁴⁸ Complacency exacerbates risk, particularly if it reflects a market-wide increase in risk taking.⁴⁹ This attitude not only leads to banks maintaining insufficient reserves to weather any crisis, but also makes them indifferent to their own excessive risk-taking and the potential

⁴² See Steven L. Schwarcz, *Conflicts and Financial Collapse: The Problem of Secondary-Management Agency Costs*, 26 YALE J. ON REG. 457 (2009).

⁴³ See Schwarcz, *supra* note 6, at 821–22.

⁴⁴ *Id.* at 821.

⁴⁵ See, e.g., Anabtawi & Schwarcz, *supra* note 34, at 1366–67; Schwarcz & Chang, *infra* note 47, at 769.

⁴⁶ For the concept of complacency in the context of financial regulation, see Anabtawi & Schwarcz, *supra* note 34, at 1366–67.

⁴⁷ For an explanation of why heuristics are ubiquitous, see Steven L. Schwarcz & Lucy Chang, *The Custom-to-Failure Circle*, 62 DUKE L. J. 767, 769 (2012) (“Reliance on a heuristic can become so routine and widespread within a community that it develops into a custom, which we refer to in this Essay as a ‘heuristic-based custom’ When a heuristic-based custom reasonably approximates reality, society should benefit. Modern finance, for example, has become so complex that the financial community routinely relies on heuristic-based customs, such as determining creditworthiness of securities by relying on formalistic credit ratings and assessing risk on financial products by relying on simplified mathematical models. Without this reliance, financial markets could not operate.”).

⁴⁸ Anabtawi & Schwarcz, *supra* note 34, at 1366.

⁴⁹ See *id.*

consequences.⁵⁰ Over-reliance on heuristics often leads to unfortunate outcomes, as these ‘rules of thumb’ or ‘customs’ simplify the decision-making process.⁵¹ Consequently, they are likely to limit the possibility of making informed decisions that “ordinary” decision-making processes typically produce.⁵² Moreover, “[w]hen a heuristic-based custom no longer reflects reality . . . reliance on the custom can become harmful.”⁵³ As noted by Schwarcz and his co-author, “[i]n recent years, for example, financial markets and products have innovated so rapidly that heuristic-based customs—and thus behavior based on those customs—have lagged behind the changing reality. The resulting mismatch has, in turn, led to massive financial failures.”⁵⁴ In addition, relying on heuristics collectively at an industry level sometimes gives rise to “correlation-seeking” behavior, which fosters undue interconnectedness among financial institutions.⁵⁵ The term “correlation-seeking” was originally coined to describe the tendency of firms to assume contingent debts that correlated with their insolvency risk or risk that a firm has exposed itself to.⁵⁶ This tendency further suggests that a firm will likely “favor the [firm] whose risk exposures are more closely correlated to its own.”⁵⁷ Reliance on heuristics usually leads firms to take on similar sources or types of risk, thereby increasing firms’ correlation-seeking behaviors and further promoting system-wide interconnectedness. Interconnectedness is what makes today’s financial systems so complex, fragile, and unstable.⁵⁸

⁵⁰ *See id.* at 1366–67.

⁵¹ Schwarcz & Chang, *supra* note 47, at 768–70.

⁵² *See id.*

⁵³ *Id.* at 770.

⁵⁴ *Id.*

⁵⁵ Correlated risk-taking can pose huge challenges to the financial system. *See* Kathryn Judge, *Interbank Discipline*, 60 UCLA L. REV. 1262, 1306–07 (2013).

⁵⁶ Richard Squire, *Shareholder Opportunism in a World of Risky Debt*, 123 HARV. L. REV. 1151 (2010).

⁵⁷ Judge, *supra* note 55, at 1307.

⁵⁸ *See id.* (“In order to engage in correlation seeking, a firm must be able to make sophisticated judgments about the risks to which it is exposed, the probability those risks will bankrupt the firm, and the correlation between those risks and other risks that the firm might assume.”); *see also* Andrew Gray, *Interconnectedness Risks Another Financial Crisis*, NIKKEI ASIAN REV. (Nov. 4, 2016), <https://asia.nikkei.com/Viewpoints/Andrew-Gray/Andrew-Gray-Interconnectedness-risks-another-financial-crisis> [https://perma.cc/

The cause of rationality failure is quite straightforward: human beings are never entirely rational for psychological and biological reasons.⁵⁹ Total rationality probably only exists in the theoretical realm of neoclassical economists. Problems caused by inherent cognitive limitations cannot be fixed until we realize we are more flesh than higher spirit, and flesh is by no means omniscient or inherently honorable.

E. Externalities/Responsibility Failure

Externalities,⁶⁰ also described as “responsibility failures” or “incentive failures,”⁶¹ arise “when the economic activities of some participants in a market indirectly affect, positively or negatively, the

AFL2-VYRX] (explaining the risks of interconnectedness in the financial sector and steps governments have taken to address them); Janet L. Yellen, Vice Chair, Fed. Reserve System, Address at the American Economic Association/American Finance Association Joint Luncheon: Interconnectedness and Systemic Risk: Lessons from the Financial Crisis and Policy Implications (Jan. 4, 2013) (transcript available at <https://www.federalreserve.gov/newsevents/speech/yellen20130104a.htm>) (“Complex interactions among market actors may serve to amplify existing market frictions, information asymmetries, or other externalities [and] [t]he difficult task . . . is to find ways to preserve the benefits of interconnectedness in financial markets while managing the potentially harmful side effects.”).

⁵⁹ For a vivid and comprehensive introduction of biological reasons, see JOHN COATES, *THE HOUR BETWEEN DOG AND WOLF: RISK-TAKING, GUT FEELINGS AND THE BIOLOGY OF BOOM AND BUST* 12 (2012) (arguing financial markets can be made more stable by greater endocrine diversity in the industry).

⁶⁰ A number of economists as well as law and economics scholars view externalities as a source/category of market failure. *See, e.g.*, ROBERT COOTER & THOMAS ULEN, *LAW & ECONOMICS* 44 (4th ed. 2004); Francis M. Bator, *The Anatomy of Market Failure*, 72 Q. J. ECON. 351, 351 (1958).

⁶¹ Steven L. Schwarcz, *Regulating Shadows: Financial Regulation and Responsibility Failure*, 70 WASH. & LEE L. REV. 1781, 1782 (2013) (“Viewing externalities as a distinct category of market failure, though, is misleading. Externalities are fundamentally consequences, not causes, of failures[.]” and therefore, “the third market-failure category should be reconceptualized as a ‘responsibility failure’”). I agree externalities in the context of market failure should be renamed as responsibility failure, but for the ease of communication, this article uses “externalities” and “responsibility failure” interchangeably.

well-being of others.”⁶² In other words, certain market participants generate costs or benefits to others for which they are neither charged nor compensated.⁶³ Translating this concept into banking, it refers to a bank’s ability “to externalize a significant portion of the costs of taking a risky action.”⁶⁴ The failure of some banks may jeopardize the solvency of others because a chain-reaction of funding withdrawals may result.⁶⁵ Simply put, the failure of an insolvent bank can produce runs on solvent banks.⁶⁶

Retail and wholesale runs on banks are the most severe externalities that impact the banking sector. Banks can increase the likelihood of a run occurring by engaging in excessive risk-taking, and even more so in the presence of a widespread perception that troubled banks will be bailed out.⁶⁷ Banks, particularly very large ones, may take excessive risks in anticipation of a public bailout should things go wrong.⁶⁸ This enables bankers to operate under the perception that they can pocket the gains obtained by risk-taking and pass on any losses to taxpayers and other banks.⁶⁹

Externalities are caused by distorted incentives allowing market participants to pursue their own interests at others’ expense.⁷⁰ Distorted incentives are largely the result of an absence of mechanisms that can charge the cost of externalizations to their respective market actors.⁷¹ Ultimately, market actors should be responsible for all costs incurred in the process of making profits for themselves.⁷² If some costs can be allocated to others without being detected or charged, a market actor will have no incentive to internalize those costs.⁷³

⁶² SCHOONER & TAYLOR, *supra* note 10, at xiii.

⁶³ *See id.*

⁶⁴ Schwarcz, *supra* note 61, at 1800.

⁶⁵ *Id.* at 1794–95.

⁶⁶ *See id.*

⁶⁷ *See id.* at 1818 (“[S]ize and concentration of financial firms tempts firms that believe they are too big to fail to engage in irresponsible behavior, such as making risky investments in order to gain profits and expecting to be bailed out (through emergency loans) if they misjudge the risk.”).

⁶⁸ *See id.*

⁶⁹ *See id.*

⁷⁰ *See id.* at 1799.

⁷¹ *See id.* at 1817.

⁷² *See* Schwarcz, *supra* note 4, at 206.

⁷³ *See id.* at 1813.

Externalities will not be eliminated unless we can re-internalize already-externalized costs to those who generated them.⁷⁴

F. Cycles of Boom-and-Bust

The boom-and-bust cycle, or the business cycle, provides a profound insight into financial crises. This paper endeavors to identify what may lead to an economic bubble bursting. In the author's opinion, there are at least two theoretical approaches that capture the essence of boom-and-bust cycles. One is the Financial Instability Hypothesis,⁷⁵ and the second is the biological perspective of boom-and-bust.⁷⁶

Economists Arthur Burns and Wesley Mitchell provide the standard definition of the business cycle:

Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle [I]n duration, business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar characteristics with amplitudes approximating their own.⁷⁷

This definition does not explain the causes of the business cycle, but rather informs us that the economy will inevitably encounter recessions, contractions, or even crises from time to time.⁷⁸ The study of these cycles teaches us a very important lesson: whenever we see a significant expansion of the economy, or a dramatic rise in asset

⁷⁴ See, e.g., Schwarcz, *supra* note 4, at 206.

⁷⁵ See Minsky, *infra* note 80, at 15.

⁷⁶ See Coates, *infra* note 92, at 331.

⁷⁷ ARTHUR F. BURNS & WESLEY C. MITCHELL, MEASURING BUSINESS CYCLES 3 (1946).

⁷⁸ See *id.*

prices, the possibility of a bust or crisis becomes imminent.⁷⁹ But what causes a bubble to inflate and subsequently burst?

Hyman Minsky believes the inherent structure of today's capitalist system renders the economy susceptible to financial crises.⁸⁰ He attributes the creation of this crisis-prone financial structure to the accumulation of debt by the non-government sector.⁸¹ According to his theory, financial intermediaries play an important role in merchandising debts.⁸² He observes, "Like all entrepreneurs in a capitalist economy, bankers are aware that innovation assures profits. Thus, bankers (using the term generically for all intermediaries in finance), whether they be brokers or dealers, are merchants of debt who strive to innovate in the assets they acquire and the liabilities they market."⁸³

Minsky then identifies three types of financing: hedge, speculative, and Ponzi.⁸⁴ With hedge financing, a firm's "cash flows from operations are expected to be large enough to meet the payment commitments on debt."⁸⁵ Speculative finance occurs when the cash flows from a firm's operations are not sufficient to fulfill its repayment obligations, despite the fact that "the present value of expected cash receipts is greater than the present value of payment commitment."⁸⁶ In other words, speculative finance can only be paid back through the regular rolling over of the principal.⁸⁷ Ponzi finance describes a situation in which cash payment commitments on debt can be met only

⁷⁹ See Minsky, *infra* note 80, at 15.

⁸⁰ Hyman P. Minsky, *The Financial Instability Hypothesis: An Interpretation of Keynes and an Alternative to "Standard" Theory*, 16 NEB. J. ECON. & BUS. 5, 15 (1977) ("There is, in the financial instability hypothesis, a theory of how a capitalist economy endogenously generates a financial structure which is susceptible to financial crises, and how the normal functioning of financial markets in the resulting boom economy will trigger a financial crisis.").

⁸¹ *Id.*

⁸² Hyman P. Minsky, *The Financial Instability Hypothesis* 6 (The Levy Econ. Inst., Working Paper No. 74, 1992), <http://www.levyinstitute.org/pubs/wp74.pdf>.

⁸³ *Id.*

⁸⁴ See Minsky, *supra* note 80, at 14.

⁸⁵ *Id.* at 13.

⁸⁶ *Id.*

⁸⁷ See *id.*

by increasing the amount of outstanding debt or through the sale of assets.⁸⁸

Minsky believes that, over a protracted period of prosperity, the capitalist economy tends to shift from a financial structure dominated by hedge finance to one dominated by speculative, and ultimately, Ponzi finance.⁸⁹ Furthermore, if an economy dominated by substantial financial units is inflating, and the authorities attempt to control inflation by monetary constraint, then “speculative units will become Ponzi units and the net worth of previously Ponzi units will quickly evaporate. Consequently, units with cash flow shortfalls will be forced to try to make position by selling out position. This is likely to lead to a collapse of asset values.”⁹⁰

While Minsky does not explain explicitly why our economy tends to move from hedge finance to speculative and Ponzi finance, this author believes that two possible reasons can be abstracted from his work. First, interest rates intentionally kept low by macroeconomic regulators make borrowers believe they can always roll over their principal amount outstanding without worrying about interest payments. Second, the belief that an anticipated appreciation in asset value will be sufficient to refinance the debt encourages borrowers to engage extensively in Ponzi finance. These two unjustified beliefs promote speculative and Ponzi-dominated sentiment, leading to the entire financial system becoming heavily indebted and unstable.

John Coates, a former Wall Street trader turned neuroscientist, provides another powerful explanation of business cycles through the study of the impact of hormone feedback loops.⁹¹ Regarding traders’ behavior and the bull-and-bear market cycle, Coates finds that, “a trader with high levels of testosterone may see only opportunity in a set of facts; while the same trader with chronically elevated cortisol may find only risk.”⁹² He goes on to conclude “[i]f traders . . . increase their appetite for risk during a bull market, and rising levels of cortisol decrease their appetite for risk during a bear market, then steroid hormones may shift risk preferences systematically across the business

⁸⁸ *Id.* at 14.

⁸⁹ Minsky, *supra* note 82, at 8.

⁹⁰ *Id.*

⁹¹ Coates, *supra* note 59, at 12.

⁹² John M. Coates, Mark Gurnell & Zoltan Sarnyai, *From Molecule to Market: Steroid Hormones and Financial Risk-taking*, 365 PHIL. TRANSACTIONS ROYAL SOC’Y B 331, 339–40 (2010).

cycle.”⁹³ Such an effect has the potential to disrupt the financial system even if it only occurs in a small number of people.⁹⁴

On the other hand, Coates contends that, during a crisis, heightened uncertainty will increase traders’ stress hormones and strongly affect the market’s ability to tackle risks.⁹⁵ Because chronic stress will lead people to “recall mostly negative memories, to see danger everywhere . . . [t]he trading community may thus become irrationally risk averse, causing the markets to freeze and monetary policy to become all but ineffective.”⁹⁶ Coates then describes how testosterone levels may foster a market boom and drive the economy to the point where a bubble bursts:

In the financial world, testosterone feedback loops, once they start, can cause traders to pass through the early stages of thrill and excitement, and end up convinced of their own infallibility. As these cycles rise to their euphoric high point, one finds traders, most of whom are young males, with impaired judgment, doing dangerously silly things. Following the pattern of the winner effect, traders experience a rise in testosterone when their trades make money, which increases their confidence and appetite for risk, so that in the next round of trading they put on even larger trades. If they win again, as they are likely to during a rising market, their profits will increase their testosterone once more, until at some point confidence becomes overconfidence, trading positions grow to a dangerous size and the risk-reward profiles of the trades start to stack the odds against them.⁹⁷

Coates’ theory posits that hormones may physically affect investors and traders during bull-and-bear markets, thereby “shift[ing] risk preferences” across the system and “amplifying the [business]

⁹³ *Id.*

⁹⁴ *See id.* at 340.

⁹⁵ John Coates, *Banks Should Train Traders Like Athletes*, FIN. TIMES (July 6, 2012), <http://www.ft.com/intl/cms/s/0/9540a99c-c694-11e1-963a-00144feabd00.html#axzz3aAi33txL>.

⁹⁶ *Id.*

⁹⁷ COATES, *supra* note 59, at 193.

cycle.”⁹⁸ If Coates’ theory is accurate, then, in addition to the accumulation of debt, hormone feedback loops can contribute significantly to financial instability.⁹⁹ An interesting point Coates makes to explain why almost every crash in the United States and the United Kingdom has taken place in the autumn is that “many animals [sic] testosterone levels fluctuate over the course of the year, and in humans these levels rise until the autumn, and then fall until the spring.”¹⁰⁰ This autumnal drop in testosterone can cause humans to “become moody, withdrawn and depressed.”¹⁰¹

Minsky’s Financial Instability Hypothesis and Coates’s testosterone-levels theory offer policymakers a novel lens through which to observe the business cycles—perspectives that may enlighten them with persuasive explanations and provide effective ways of resolving economic bubbles. Most importantly, Coates and Minsky both indicate that the formation and bursting of economic bubbles, though thought to be almost inevitable, can be *monitored* and *controlled*.¹⁰² On Minsky’s hypothesis, a balanced use of monetary and fiscal policy may rein in the size of speculative and Ponzi finance and deflate an already-formed bubble.¹⁰³ On the other hand, Coates’s theory implies that financial markets can be made more stable by having greater endocrine diversity in the financial industry and through a mechanism that treats traders like athletes.¹⁰⁴

These two theories are certainly not the exclusive answers as to what causes the cycles of boom-and-bust, nor are their recommendations the only practical mechanisms to prevent bubbles from bursting.¹⁰⁵ Yet, by introducing these two theories, this paper aims to show that we know less than we thought about the causes of

⁹⁸ *Id.* at 266–67 (“Hormones—and the cascade of other molecular signals hormones trigger—may build up in the bodies of traders and investors during bull and bear markets to such an extent that they shift risk preferences, amplifying the cycle.”).

⁹⁹ *See id.*

¹⁰⁰ *Id.* at 204.

¹⁰¹ *Id.*

¹⁰² *See* COATES, *supra* note 59, at 237–42; Minsky, *supra* note 80, at 7.

¹⁰³ *See* Minsky, *supra* note 82, at 7.

¹⁰⁴ *See* COATES, *supra* note 59, at 237–42.

¹⁰⁵ For instance, the “Regulatory Instability Hypothesis” proposed by Professor Erik Gerding illustrates how financial regulations can add fuel to asset price bubbles. *See* ERIK F. GERDING, LAW, BUBBLES AND FINANCIAL REGULATION 8 (2013).

economic bubbles and the sources of financial instability. Thus, regulatory approaches must be forward-looking and adaptive in order to accommodate the inherent limitations of human wisdom and to rectify things promptly when they go wrong.

Nonetheless, in addition to these general vulnerabilities, there are at least seven specific types of deficiencies evident in the contemporary financial system. A brief analysis of each will enhance our understanding of the regulatory challenges we face and help us understand the strengths and limitations of any regulatory prescriptions.

This paper identifies the specific fundamental deficiencies as the “Seven Deadly Sins” of the contemporary financial system. Referring to these deficiencies as “sins” does not necessarily mean they are evil, or that any particular individual or group should be held responsible. The biblical concept of sin denotes failure—“failure to live up to a standard, failure to hit the bull’s eye, [and] failure to stay on the path.”¹⁰⁶ The sins identified in this paper denote system-wide failures for which financial market participants are collectively responsible. These failures might result from a lack of sufficient knowledge, collective ignorance of how human brains and behaviors function, distorted institutional and market incentives, inadequately designed regulatory regimes, and the greed of certain market actors.¹⁰⁷ Importantly, these sins are in fact developed from good intentions. Just like the original meaning of the word, these sins do not completely disregard the target or bull’s eye. Rather, they simply miss or deviate from. Each “sinful” act could, to some extent, be seen as the miscarried pursuit of a justifiable end and therefore not inherently wrong.

¹⁰⁶ *Bible Verses About Missing the Mark, Forerunner Commentary for John 8:34*, BIBLETOOLS, <http://www.bibletools.org/index.cfm/fuseaction/Topical.show/RTD/cgg/ID/1678/Missing-Mark.htm> [<https://perma.cc/B2E3-4JMN>].

¹⁰⁷ See Schwarcz, *supra* note 6, at 815, 818–25 (discussing four types of market failures, information failure, rationality failure, principal-agent failure, and incentive failure).

III. Seven Deadly Sins: Fundamental Deficiencies in the Contemporary Financial System

A. Dominance of Excessive Risk-Taking Behaviors/ Culture

Risk-taking is the necessary path to profit-making and therefore not an intrinsically bad thing.¹⁰⁸ Yet, risk-taking should not become excessive to the extent that the potential negative consequences disproportionately outweigh the projected profits. Most importantly, risk-taking should not result in heedless gambling that ends in catastrophe and is costly for everyone. Unfortunately, this principle was not observed on Wall Street prior to the GFC. Despite the multifaceted nature of the crisis, most commentators agree that Wall Street's behaviors were excessively risky and incurred immense costs for "Main Street."¹⁰⁹ Commercial bankers granted loans to people they knew would not be able to repay them,¹¹⁰ traders gambled with enormous trading positions and highly speculative derivatives transactions,¹¹¹ and investment bankers packaged and sold "toxic" securitized products.¹¹² What made the situation worse was that many financial institutions were highly leveraged.¹¹³

According to the Financial Crisis Inquiry Commission, which was established to determine the causes of the Financial Crisis in the United States, "as of 2007, the five major [U.S.] investment banks—Bear Stearns, Goldman Sachs, Lehman Brothers, Merrill Lynch, and Morgan Stanley—were operating with extraordinarily thin capital. By one measure, their leverage ratios were as high as 40 to 1."¹¹⁴ This

¹⁰⁸ See Baxter, *Betting Big* *infra* note 124, at 798 n.125.

¹⁰⁹ See, e.g., U.S. FIN. CRISIS INQUIRY COMM'N, THE FINANCIAL CRISIS INQUIRY REPORT 67–80 (2011) [hereinafter *Inquiry Report*], fcic-static.law.stanford.edu/cdn_media/fcic-reports/fcic_final_report_full.pdf.

¹¹⁰ For a description of how commercial banks engage themselves in toxic mortgage lending activities, see *id.* ("[M]ortgage companies, banks, and Wall Street securities firms began securitizing mortgages. And more of them were subprime Selling these required investors to adjust expectations With these new non-agency securities, investors had to worry about getting paid back.").

¹¹¹ *Id.* at 45–51.

¹¹² *Id.* at 102–126.

¹¹³ *Id.* at xix.

¹¹⁴ *Id.*

essentially meant that a decline in asset values of less than 3 percent could easily wipe these financial institutions out.¹¹⁵ The two behemoth government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac, operated with the highest leverage ratios: 75 to 1.¹¹⁶ Moreover, certain mechanisms more akin to gambling than to traditional finance also held the power to bring down a firm or even the entire industry.¹¹⁷ Synthetic CDOs, for example, are regarded as “mere[] bets on the performance of real mortgage-related securities[,]”¹¹⁸ but may in fact amplify losses from the bursting of a housing bubble by allowing multiple bets on the same securities.¹¹⁹ Goldman Sachs packaged and sold \$73 billion worth of these synthetic CDOs from mid-2004 to mid-2007.¹²⁰ Of the 3,400 mortgage securities referenced by these CDOs, 610 were referenced at least twice.¹²¹ This figure does not show how many times these securities may have been referenced in synthetic CDOs sold by firms other than Goldman Sachs as well.¹²² These excessive risk-taking activities were surely undertaken in the pursuit of profits, but what really drove them to reach an unmanageable and unsustainable scale?

The reasons why the financial industry is dominated by excessive risk-taking are multifaceted and cannot be listed exhaustively. However, at least four stand out. First, the management of financial institutions usually pursue unrealistic profits because their performance metrics are inadequate.¹²³ For example, banks tend to use “Return on Equity” (ROE) to measure the success of management’s performance. Many believe that high-performance banks should produce a ROE between 15 percent and 20 percent, despite the fact that the average ROE for all insured banks is generally between 8 percent and 11 percent.¹²⁴ Relying solely on ROE to evaluate

¹¹⁵ *Id.*

¹¹⁶ *Id.* at xx.

¹¹⁷ *Id.* at xxiv–xxv.

¹¹⁸ *Id.* at xxiv.

¹¹⁹ *Id.* at xxiv–xxv.

¹²⁰ *Id.*

¹²¹ *Id.* at xxv.

¹²² *Id.*

¹²³ See Haldene, *infra* note 125, at 9–10.

¹²⁴ Lawrence G. Baxter, *Betting Big: Value, Cautions and Accountability in an Era of Larger Banks and Complex Finance*, 31 REV. BANKING & FIN. L. 765, 801–05 (2012); see also Lawrence G. Baxter, *The Widening Financial Gyre*, THEPARETOCOMMONS (Sep. 19, 2011), <http://www.theparetocommons>.

management is inadequate because it is easily manipulated by increasing leverage.¹²⁵ For example, a relatively inefficient bank can nevertheless increase ROE if it increases operational leverage.¹²⁶ Instead, the ideal metrics are those that are “less focused on a narrow subset of the balance sheet and do a better job of adjusting for risk.”¹²⁷ For instance, “Return on Assets” (ROA), is regaining popularity as it covers the entire balance sheet and is not exaggerated by leverage.¹²⁸

Second, the innovation in banks’ business models allows them to relax their mortgage-lending standards and pay less attention to the quality of loans they make.¹²⁹ Securitization made many banks shift their business models from the traditional “originate-to-hold” model towards an “originate-to-distribute” one.¹³⁰ Many commercial banks are no longer originating loans to hold to maturity in anticipation of earning an interest margin.¹³¹ With securitization, commercial banks are now able to remove loans that they originate from their balance sheets as soon as these loans are made.¹³² This capability enables banks to act carelessly when granting mortgages to homebuyers, knowing that someone else will bear the risk of default on those mortgages.¹³³ Diminished exposure to the consequences of their

com/2011/09/the-widening-financial-gyre/ [https://perma.cc/ZSN9-3DU2] (discussing the unrealistic performance goals of large financial firms in an anemic growth environment); Patrick Jenkins, *Banks Need to Look Past RoE on Profitability*, FIN. TIMES (Nov. 7, 2011, 6:09 PM), <http://www.ft.com/intl/cms/s/0/abd5403e-0955-11e1-a20c-00144feabdc0.html#axzz3Vossvy6d>.

¹²⁵ Andrew G. Haldane, Exec. Dir., Fin. Stability, Bank of Eng., Address at the Wincott Annual Memorial Lecture: Control Rights (and Wrongs) (2011) (transcript available at <http://www.bis.org/review/r111026a.pdf>).

¹²⁶ Baxter, *Betting Big*, *supra* note 124, at 804–05.

¹²⁷ Haldane, *supra* note 125, at 13.

¹²⁸ *Id.*

¹²⁹ See Amiyatosh K. Purnanandam, *Originate-to-Distribute Model and the Subprime Mortgage Crisis* 1–2 (Fed. Deposit Ins. Corp. Working Paper No. 2010-08, 2010), <http://papers.ssrn.com/abstract=1167786> [https://perma.cc/6JNR-22FY].

¹³⁰ *Id.* at 1.

¹³¹ *See id.* at 1–2.

¹³² *See id.* at 2.

¹³³ *See id.* Nevertheless, some commentators do not agree with the idea that banks use securitization to pass its risk to “the fool next in the chain.” Rather, they propose banks intentionally used securitization to take on more risk, not

actions provides banks with a distorted incentive to engage in more risky lending activities.¹³⁴

Third, allowing the growth of universal banks and financial holding companies exposes commercial banking to investment banking culture. Commercial bankers have a very different culture to that of investment bankers and traders.¹³⁵ Commercial bankers tend to be prudent and self-restrained in risk taking; investment bankers and traders tend to be bold and always eager to take great risks.¹³⁶ With universal banks and financial holding companies under the same corporate roof, the two separate cultures operate: the “hate-to-lose” culture of commercial bankers, and the “love-to-win” culture of investment bankers.¹³⁷ Accommodative monetary policy makes the “love-to-win” culture dominant within banks because the payoff from the “hate-to-lose” style becomes less attractive.¹³⁸ Hence, under this mentality, banks used to rely more on proprietary trading than traditional lending as their major source of profits.¹³⁹ Such reliance

to sell it to unknowing clients. See Hyun Song Shin, *Securitisation and Financial Stability*, 119 THE ECON. J. 309, 309 (2009).

¹³⁴ For the importance of requiring lenders to retain skin in the game in securitization, see Christopher M. James, *Mortgage-Backed Securities: How Important is “Skin in the Game”?*, FED. RES. BANK S.F., ECONOMIC LETTER (2010), <https://www.frbsf.org/economic-research/files/el2010-37.pdf>. However, some commentators have casted doubt on the efficacy of such a “skin in the game” regime. See Opinion, Paul Krugman, *Is Skin in the Game the Answer?*, N.Y. TIMES (June 19, 2009, 1:15 PM), <http://krugman.blogs.nytimes.com/2009/06/16/is-skin-in-the-game-the-answer/>.

¹³⁵ See NICHOLAS DUNBAR, *THE DEVIL’S DERIVATIVES: THE UNTOLD STORY OF THE SLICK TRADERS AND HAPLESS REGULATORS WHO ALMOST BLEW UP WALL STREET—AND ARE READY TO DO IT AGAIN* xii–xiii (2011).

¹³⁶ See *id.*

¹³⁷ See *id.*

¹³⁸ See *id.* at xiii–xiv.

¹³⁹ Theo Francis, *How America’s Biggest Bank Makes Money*, NPR (Aug. 7, 2012, 12:51 PM), <https://www.npr.org/sections/money/2012/08/03/158047349/how-americas-biggest-bank-makes-money> [<https://perma.cc/2WED-ZXEV>]. This calculus for U.S. banks has changed due to the introduction of the Volcker Rule and the implementation of its accompanying regulations, but a recent attempt to rewrite the rule by the Trump Administration may well bring the unpleasant practice back. See Benjamin Bain & Jesse Hamilton, *Wall Street Regulators Are Set to Rewrite the Volcker Rule*, BLOOMBERG (Aug. 2, 2017, 4:01 AM),

encourages traders to do whatever they want, so long as it generates spectacular profits. As a result, every banker becomes willing to take ever greater risks, since that brings huge bonuses and wins the boss's approval.

Fourth, the expectation of being bailed out by the government should things go wrong encourages excessive risk-taking. Perceiving themselves as too-big-to-fail, some financial conglomerates readily take as much risk as they can so as to maximize profit. Their ability to pocket profits while passing losses to taxpayers reinforces the dominance of the excessive-risk-taking culture, and diminishes accountability across the wider financial system.

B. Over-reliance on Short-Term Funding

While “borrow short and fund long” is not the only fundamental difference between banks and other commercial institutions, it nevertheless remains a key characteristic of banks.¹⁴⁰ Maturity transformation, if done efficiently, can facilitate market-wide credit allocation and fulfill credit needs that are potentially beneficial to the wider economy.¹⁴¹ However, pushing this practice to the extreme may also subject the entire financial system to disastrous bank runs.¹⁴²

Traditional banking relies on deposits as the major source of funding, while modern banking relies more on repurchase agreements

08-01/volcker-rewrite-is-said-to-start-as-trump-regulators-grab-reins [https://perma.cc/25ZW-ZS7B].

¹⁴⁰ *The Long and the Short of It*, THE ECONOMIST: BUTTONWOOD (Apr. 30, 2007), www.economist.com/node/9725837 (“Investors have been doing what banks have done over the centuries, borrowing short and lending long.”).

¹⁴¹ See OFF. OF FIN. RESEARCH, 2014 ANN. REP. 11–12 (2014), https://www.financialresearch.gov/annual-reports/files/office-of-financial-research-annual-report-2014.pdf.

¹⁴² The U.S. Office of Financial Research also recognizes that short-term funding markets are instrumental in providing liquidity to keep the global financial system operating, but are subject to run risks. See *id.* at 2 (“Short-term funding markets are critical to market functioning as an efficient source of financing, but may create systemic vulnerabilities. We remain concerned about risks related to short-term wholesale funding markets, given that incentives still exist for runs and asset fire sales during periods of stress.”).

(repos)¹⁴³ and interbank lending.¹⁴⁴ Since depositors are now protected by deposit insurance, a depositors' run is no longer a major concern for banks in certain countries.¹⁴⁵ Yet, a wholesale run initiated by repo and interbank lenders remains the primary source of instability in the contemporary financial system. Customarily, borrowers safeguard wholesale short-term lenders by providing collateral, which lessens the risks of defaulting by counterparties.¹⁴⁶ Unfortunately, the mechanism of collateral has been dramatically distorted by the innovative practice of "rehypothecation," and has been dampened by the growing interconnections between banks.¹⁴⁷

Rehypothecation is the process in which "a repo borrower puts up securities as collateral for a repo loan . . . and then the repo lender uses the same securities as collateral to get its own repo loan . . . and the second lender uses the securities as collateral to get its own repo loan . . . and so on."¹⁴⁸ This creates a complex chain of credit secured by one collateral item and chains of lenders that are far less protected than they thought.¹⁴⁹ The situation worsens when banks, brokers, and

¹⁴³ See UNDERSTANDING REPOS AND THE REPO MARKETS, EUROCLEAR 3 (2009), <http://www.theotcspace.com/sites/default/files/2011/11/003-the-repo-market.pdf>.

¹⁴⁴ See FREDERIC MISHKIN, THE ECONOMICS OF MONEY, BANKING, AND FINANCIAL MARKETS 318 (Alexandra Dyer et al. eds., 4th ed. 2011).

¹⁴⁵ See Rajkamal Iyer & Manju Puri, *Understanding Bank Runs: The Importance of Depositor-Bank Relationships and Networks 2* (Fed. Deposit Ins. Corp. Ctr. for Fin. Research, Working Paper No. 2008-11, 2008). <https://www.fdic.gov/bank/analytical/cfr/2008/wp2008/2008-11.pdf>. It is noteworthy, though, that in the Eurozone, "deposits accounted for 45 per cent of funding in 2015, up from 29 per cent in 2009, while wholesale money slumped from 38 to 23 per cent," which suggests some banks are shifting from their reliance on wholesale funding to deposit funding. This, however, may still subject banks to runs by flighty, short-term online deposits and does not necessarily make the financial system more stable. Patrick Jenkins, *Northern Rock's Hidden Lesson: Online Bank Deposits Pose A Systemic Risk*, FIN. TIMES (Sept. 18, 2017), <https://www.ft.com/content/c5d52bda-9c5b-11e7-9a86-4d5a475ba4c5?tagToFollow>.

¹⁴⁶ See MISHKIN, *supra* note 144, at 169.

¹⁴⁷ See *The Media Buzz About Rehypothecation*, REPOWATCH (July 30, 2013), <http://repowatch.org/2012/01/09/the-media-buzz-about-rehypothecation/> [<https://perma.cc/Q9UH-3G5M>].

¹⁴⁸ See *id.*

¹⁴⁹ See *id.*

dealers serve as both lenders and borrowers.¹⁵⁰ When a great number of loans and credits are guaranteed only by a tiny amount of collateral, a margin call¹⁵¹ can easily trigger a domino effect and amplify market strains.¹⁵² Additionally, repos and securities lending are neither protected by a financial safety net nor guaranteed by an insurance-like official regime.¹⁵³ If anyone in the chain defaults or if the price of the collateralized securities falls, other parties may withdraw their money or make margin calls, which could potentially initiate fire sales of collateralized securities.¹⁵⁴

Such a situation suggests that over-reliance on short-term funding has the potential to destroy the wider economy. In a 2013 speech at Yale Law School, a member of the Federal Reserve Board of Governors, Daniel Tarullo, explained:

[T]he practice of many firms, including all those with sizeable broker-dealers, of funding large amounts of assets with short-term wholesale funding was an accelerant of all the problems that had grown within the financial system. When questions arose about the quality of some of the assets on which short-term funding had been provided, investors who had regarded short-term secured lending as essentially risk-free suddenly became unwilling to lend against a wide range of assets. Then ensued the classic adverse feedback loop, as liquidity-strained institutions found themselves forced to sell positions, which placed additional downward pressure on asset prices, thereby accelerating margin calls on leveraged actors and

¹⁵⁰ *See id.*

¹⁵¹ A “margin call” occurs when a broker requires an investor who trades on margin (borrowed funds) to deposit more money or securities as collateral with the broker, generally because the securities originally bought on margin have declined in value. *Margin Call*, INVESTOPEDIA, <https://www.investopedia.com/terms/m/margincall.asp> [<https://perma.cc/5M6M-GBFC>].

¹⁵² *See id.*

¹⁵³ *See* Joshua Kennon, *Rehypotheication Could be the Next Major Investment Disaster*, THE BALANCE (Oct. 17, 2016), <https://www.thebalance.com/rehypotheication-investment-disaster-357232> [<https://perma.cc/E9TC-KRAU>].

¹⁵⁴ *See The Media Buzz About Rehypotheication*, *supra* note 147.

amplifying mark-to-market losses for all holders of the assets.¹⁵⁵

The scenario Mr. Tarullo depicted is exactly what happened at the outset of the GFC.¹⁵⁶ What made this scenario possible was the banks' over-reliance on extremely short-term funding.¹⁵⁷ Short-term funding is generally thought of as less than nine months, but may also mean one day.¹⁵⁸ Overnight borrowing requires borrowers to 'roll-over' their loans every day, thus subjecting their liquidity to daily market fluctuations.¹⁵⁹ For example, Bear Stearns only had around \$12 billion in equity and \$383 billion in liabilities, but borrowed as much as \$70 billion in the overnight market by the end of 2007.¹⁶⁰ No financial institution can stay safe and stable if it borrows six times its equity every day. Despite certain quantitative liquidity regulations such as the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) being introduced by the Basel III regime and creating an incentive for banks to "offset the risks of the short-term wholesale funding structures that proved so dangerous in the recent crisis,"¹⁶¹ such over-reliance on short-term funding should still be a significant concern for regulators as the efficacy of this post-Crisis regulation remains to be seen. According to Mr. Tarullo in his 2013 remarks, "[a]lthough the amounts of short-term wholesale funding have come down from their pre-crisis peaks, this structural vulnerability remains, particularly in funding channels that can be grouped under the heading of securities financing transactions (SFTs)."¹⁶² He went on to urge that "specific

¹⁵⁵ Daniel K. Tarullo, Governor, Fed. Reserve Sys., Address at the Yale Law School Conference on Challenges in Global Financial Services: Macprudential Regulation (Sep. 20, 2013) (transcript available at www.federalreserve.gov/newsevents/speech/tarullo20130920a.htm#f23).

¹⁵⁶ See, e.g., Inquiry Report, *supra* note 109, at 343.

¹⁵⁷ See *id.*

¹⁵⁸ See *id.* at 30.

¹⁵⁹ *Id.*

¹⁶⁰ *Id.* at xix–xx.

¹⁶¹ Daniel K. Tarullo, Governor, Fed. Reserve Sys., Address at the Federal Reserve Bank of Cleveland and Office of Financial Research 2016 Financial Stability Conference: Financial Regulation Since the Crisis (Dec. 2, 2016) (transcript available at <https://www.federalreserve.gov/newsevents/speech/tarullo20161202a.htm>).

¹⁶² Tarullo, *supra* note 155. Despite the E.U.'s adoption of the securities financing transactions regulation (SFTR) in 2015 to increase the transparency

policies to counteract the structural vulnerabilities created by short-term wholesale funding are a priority, not just for the stability of our large prudentially regulated institutions, but for the financial system as a whole.”¹⁶³ Aside from the potentially-detrimental consequences, one cannot help but ask what really caused such over-reliance on short-term funding. There are at least three possible explanations.

First, debt financing is perceived to be cheaper than equity financing.¹⁶⁴ Furthermore, short-term debt can be cheaper than long-term debt.¹⁶⁵ Under the U.S. tax code, interest payments to lenders are tax deductible for a bank.¹⁶⁶ This tax deduction provides a huge incentive for banks to fund their operations by raising debt rather than equity.¹⁶⁷ Short-term borrowing largely reduces counterparty risk—as lenders do not need to wait too long for repayment—driving down borrowers’ funding costs.¹⁶⁸

Second, a low interest rate environment motivates retail investors to pursue other deposit-like products, such as Money Market

of SFTs in response to the FSB’s policy framework for addressing shadow banking risks in securities lending and repos, the U.S. seems not to have undertaken the same regulatory endeavors so far. For the EU SFTR, see Council Regulation 2015/2365, 2015 O.J. (L 337), available at <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2365>.

¹⁶³ *Id.*

¹⁶⁴ Karen Berman & Joe Knight, *When is Debt Good?*, HARV. BUS. REV. (July 15, 2009), <https://hbr.org/2009/07/when-is-debt-good> [<https://perma.cc/KL23-LBHH>]. The proposition that funding through capital is more expensive than through debt has been challenged by a number of commentators, and sometimes viewed as a fallacy. See Anat R. Admati et al., *Fallacies, Irrelevant Facts, and Myths in the Discussion of Capital Regulation: Why Bank Equity is Not Expensive*, 15–18 (Rock Cent. for Corp. Gov. at Stanford Univ. Working Paper No. 86, 2011), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2349739 [<https://perma.cc/S88F-KZAZ>].

¹⁶⁵ *Short-Term Debt as a Long-Term Strategy: Is it Sustainable?*, FIN. EXPRESS (Feb. 19, 2006), <http://www.financialexpress.com/archive/short-term-debt-as-a-long-term-strategy-is-it-sustainable/147595/> [<https://perma.cc/MCQ4-X4VQ>].

¹⁶⁶ See Opinion, Felix Salmon, *Should Banks Get to Deduct Their Interest Costs?*, REUTERS (Sept. 21, 2012), <http://blogs.reuters.com/felix-salmon/2012/09/21/should-banks-get-to-deduct-their-interest-costs/> [<https://perma.cc/K4L4-2DCZ>].

¹⁶⁷ See Admati et al., *supra* note 164, at 19–21.

¹⁶⁸ See *id.* at 21–23.

Funds (MMFs).¹⁶⁹ This drives managers of MMFs to invest heavily in the repo or commercial paper market because it allows them to withdraw their money within a very short period and “maintain a strong liquidity position to meet potential investor redemptions.”¹⁷⁰

Third, the rapid growth of funds under management by institutional investors (such as pension funds, mutual funds, state and municipal funds) makes short-term accessible investment options attractive and popular.¹⁷¹ Although these institutional entities hold cash for a variety of reasons, they all prefer a safe investment that can earn interest, while at the same time allowing for flexibility that allows them to use the cash when needed.¹⁷² The widespread demand for short-term and accessible products provides funding sources for financial institutions and further reinforces banks’ reliance on them.¹⁷³

C. Inevitable Deficiency in Hedging Tools

Hedging is a necessary means of safeguarding the soundness of financial institutions. Yet hedging often sounds like a fallacy,

¹⁶⁹ See Chris Seabury, *How Interest Rates Affect the U.S. Markets*, INVESTOPEDIA (Mar. 17, 2017), <https://www.investopedia.com/articles/stocks/09/how-interest-rates-affect-markets.asp> [<https://perma.cc/WEU5-4SSB>]; see also IMF, *Risk Taking, Liquidity, And Shadow Banking: Curbing Excess While Promoting Growth*, Global Financial Stability Report 80 (Oct. 2014) (“Bank restrictions, low real interest rates, and demand from institutional cash pools have been key drivers behind the growth of MMFs in the United States.”).

¹⁷⁰ Naohiko Baba, Robert N. McCauley & Srichander Ramaswamy, *US Dollar Money Market Funds and Non-US Banks*, BIS Q. REV. 68 (Mar. 2009), https://www.bis.org/publ/qtrpdf/r_qt0903.pdf; see SEC DIV. OF INV. MGMT., MONEY MARKET FUND STATISTICS 2 (2017), <https://www.sec.gov/divisions/investment/mmf-statistics/mmf-statistics-2017-10.pdf>.

¹⁷¹ See Andrew G Haldane, Exec. Dir., Financial Stability and member of the Financial Policy Committee, Bank of England, Speech at the London Business School: The Age of Asset Management? (Apr. 4, 2014) (transcript available at <http://www.bankofengland.co.uk/publications/Documents/speeches/2014/speech723.pdf>) (“In the United States, [assets under management] have risen almost fivefold relative to GDP since 1946 The asset management industry has, it appears, come of age.”).

¹⁷² *Id.* at 10.

¹⁷³ *Id.*

especially in the context of complex and risky banking. The innovative tools that financial experts create for banks to hedge their positions increase banks' vulnerability to risky and detrimental consequences.¹⁷⁴ Some of these tools, such as credit default swaps (CDS), introduce and concentrate downside risk because they have been abused as betting machines by traders.¹⁷⁵ The essence of hedging requires investors to hold an additional position to offset the risk of adverse price movements in an asset they own.¹⁷⁶ If operated successfully, hedging can also make profits.¹⁷⁷ This gives traders discretion to determine how much of an offsetting position to hedge, or whether profit-making and hedging can be achieved through the same trade.¹⁷⁸ The reality is that the line between hedging and proprietary trading has become blurred and more difficult to distinguish.¹⁷⁹

A classic example of the blurring between hedging and proprietary trading is the post-GFC "London Whale" scandal.¹⁸⁰ J.P. Morgan, an internationally successful bank that weathered the crisis fairly well, was nevertheless dragged down by the notorious "London Whale" debacle.¹⁸¹ This caused it to lose more than \$6 billion, to incur approximately \$920 million in regulatory penalties, and to pay out \$150 million in investor compensation claims under a class action lawsuit.¹⁸²

¹⁷⁴ Hedging is a form of risk dispersion or "marginalization" of risk, and therefore can lead to market failures, causing market participants to underestimate and under-protect against risk. See Steven L. Schwarcz, *Marginalizing Risk*, 89 WASH. U. L. REV. 487, 501–02 (2012).

¹⁷⁵ *Id.* at 491 n.16 ("The general risk-dispersing principles should be the same for securitization and CDS; but because derivatives, including CDS, are sometimes used for speculation, the regulatory concerns go beyond those of merely dispersing risk.")

¹⁷⁶ See Mishkin, *supra* note 146, at 305.

¹⁷⁷ See *id.*

¹⁷⁸ *Id.* at 496–97.

¹⁷⁹ See, e.g., Dominic Rushe, *London Whale Scandal to Cost JP Morgan \$920m in Penalties*, THE GUARDIAN (Sep. 20, 2013, 4:22 AM), <http://www.theguardian.com/business/2013/sep/19/jp-morgan-920m-fine-london-whale> [<https://perma.cc/D6VN-M3GB>].

¹⁸⁰ *Id.*

¹⁸¹ *Id.*

¹⁸² See Nate Raymond, *JP Morgan to Pay US \$150M in 'London Whale' US Class Action*, IFR ASIA (Dec. 21, 2015), [http://www.ifrasia.com/jp-morgan-to-pay-us\\$150m-in-london-whale-us-class-action/21229960.article](http://www.ifrasia.com/jp-morgan-to-pay-us$150m-in-london-whale-us-class-action/21229960.article) [<https://perma.cc/HNM9-D2M7>]; Rushe, *supra* note 179.

According to the testimony of J.P. Morgan's CEO, Jamie Dimon, before the U.S. Senate Banking Committee, the Chief Investment Office (CIO) in London that incurred the \$6 billion loss was actually expected to "manage an approximately \$350 billion portfolio in a conservative manner,"¹⁸³ and to "maintain[] a smaller synthetic credit portfolio for which the original intent was to protect—or 'hedge'—the company against a systemic event."¹⁸⁴ However, the CIO did not live up to its responsibilities.¹⁸⁵ According to Dimon, in December 2011, the CIO was instructed to reduce risk-weighted assets and associated risk in anticipation of new Basel capital requirements.¹⁸⁶ And, while "the CIO could have simply reduced its existing positions" in the synthetic credit portfolio, "[it] embarked on a complex strategy that entailed adding positions that it believed would offset the existing ones" instead.¹⁸⁷

J.P. Morgan's experience shows how difficult it is to distinguish between hedging, proprietary trading, and pure gambling.¹⁸⁸ This is why hedging is potentially deficient in modern finance: it can eventually create more risk than the original investment position. The results of hedging strategies vary depending on how well traders estimate risk and avoid excess ambition to make a profit. However, it seems inevitable that hedging sometimes results in excessive risk-taking. Ultimately, we shall never reach consensus on how to reasonably and precisely estimate risk or to "offset" investments to effectively hedge those risks.

D. Ignorance of the Sources and the Feedback Loop of Shadow Banking Activities

Non-bank financial intermediation, or "shadow banking," can supplement and complement traditional banking.¹⁸⁹ When properly

¹⁸³ *A Breakdown in Risk Management: What Went Wrong at JPMorgan Chase?: Hearing Before the S. Comm. on Banking, Hous., and Urban Affairs*, 112th Cong. (2012) (statement of Jamie Dimon, Chairman & CEO, JPMorgan Chase & Co.).

¹⁸⁴ *Id.* at 1.

¹⁸⁵ *Id.* at 1–2.

¹⁸⁶ *Id.*

¹⁸⁷ *Id.*

¹⁸⁸ *See id.*

¹⁸⁹ For a widely used definition of "shadow banking" proposed by the U.K. Financial Stability Board, see FIN. STABILITY BD., STRENGTHENING

structured and managed, many shadow banking activities can benefit the wider economy through increased funding, liquidity, efficiency, and diversification and mitigation of risk.¹⁹⁰ Nonetheless, non-bank activities potentially pose a systemic risk if they involve imperfect maturity or liquidity transformation and the excessive build-up of leverage.¹⁹¹ Failure to understand the sources and the feedback loop of shadow banking activities will adversely affect regulators' ability to respond in a timely manner to systemic events that result from these activities.

Not until the GFC had the financial world paid serious attention to shadow-banking entities and activities.¹⁹² Classical forms of shadow banking—such as MMFs, securitization, and securities lending and repos—all played significant roles in contributing to the crisis.¹⁹³ Yet, it was only after the GFC that policymakers became fully aware of the diverse types of shadow banking and the vulnerabilities it had introduced into the global financial system.¹⁹⁴ Shadow banking activities generally mimic or approximate both the deposit and lending functions of banks, but are not as regulated or closely monitored.¹⁹⁵ For instance, repos and MMFs may cause wholesale runs on financial institutions, just like depositors can on commercial banks.¹⁹⁶ However, what made the shadow-banking situation during the GFC even worse was that there was no deposit-insurance-like mechanism to discourage repo lenders or MMF investors from withdrawing their money, and no formal access for them to the liquidity-pool provided by central

OVERSIGHT AND REGULATION OF SHADOW BANKING 1 (2012) (U.K.), http://www.financialstabilityboard.org/publications/r_121118.pdf. For the overall scope and basic characteristics of shadow banking, see Steven L. Schwarcz, *Regulating Shadow Banking*, 31 REV. BANKING & FIN. L. 619 (2012).

¹⁹⁰ INST. OF INT'L FIN., "SHADOW BANKING": A FORWARD LOOKING FRAMEWORK FOR EFFECTIVE POLICY 1 (2012).

¹⁹¹ *Id.*

¹⁹² See Bryan J. Noeth & Rajdeep Sengupta, *Is Shadow Banking Really Banking?*, THE REGIONAL ECONOMIST 8, 8 (2011), https://www.stlouisfed.org/~media/Files/PDFs/publications/pub_assets/pdf/re/2011/d/shadow_banking.pdf.

¹⁹³ See *id.* at 13.

¹⁹⁴ See *id.*

¹⁹⁵ See Noeth & Sengupta, *supra* note 192, at 10.

¹⁹⁶ *Id.*

banks.¹⁹⁷ Furthermore, entities that conduct non-bank financial activities are not subject to prudential regulations.¹⁹⁸ As a result, most shadow-banking entities, such as MMFs and trust companies, are not always subject to capital buffer, liquidity requirement, and single counterparty exposure limits—the very requirements that would make these entities less susceptible to maturity mismatch and sudden withdrawals.¹⁹⁹

Nevertheless, not all shadow-banking activities should be subject to bank-like regulations, unless they represent a systemic risk to the financial system.²⁰⁰ Hedge funds, for example, are typically backed by rich and sophisticated investors and their losses will normally not be borne by banks and the broader banking system.²⁰¹ Imposing strict prudential regulations on these entities is unnecessary and potentially detrimental to the wider economy. Ignorance of the different sources of shadow-banking activities and their distinct characteristics results in either inattention to potential system-wide risks or undue repression of economic vitality.

In addition to ignorance of the sources of shadow banking, a lack of clear understanding of the feedback loop for non-bank financial intermediaries further undermines our capacity to manage effectively the risks posed by these activities. The rapid growth in shadow banking is not without legitimacy. Often, when the regular banking system fails to meet wider financing and investing needs, a non-bank financial intermediary satisfies them.²⁰² Such “credit-needs gaps” introduce shadow-banking activities that fill the gaps until economic efficiency increases. Credit-needs gaps are generally created by inefficient markets.²⁰³ The low interest rate environment since 2007 makes MMFs particularly attractive, as they provide investors and

¹⁹⁷ *See id.* at 9–10.

¹⁹⁸ Dodd-Frank Wall Street Reform and Consumer Protection Act Pub. L. No. 111-203, § 113(a)(1), 124 Stat. 1376 (2010); 12 U.S.C. 5323(a)(1) (2012).

¹⁹⁹ *See* Noeth & Sengupta, *supra* note 192, at 9.

²⁰⁰ *See* Schwarcz, *supra* note 189, at 640.

²⁰¹ Kimberly Amadeo, *Who Invests in Hedge Funds and Why?*, THE BALANCE (Mar. 28, 2017), <https://www.thebalance.com/who-invests-in-hedge-funds-and-why-3306239> [<https://perma.cc/CJ7F-8WWS>].

²⁰² *See* Greg Buckak et al., *Fintech, Regulatory Arbitrate, and the Rise of Shadow Banks 2*, (Nat'l Bureau of Econ. Research, Working Paper No. 23288, 2017), <http://www.nber.org/papers/w23288.pdf>.

²⁰³ *Id.* at 1.

institutional cash managers with a relatively safe short-term investing alternative.²⁰⁴ Prudential policies can also address the credit-needs gap. For instance, trust companies became popular in China because financing costs for small- and medium-sized enterprises escalated as the government implicitly encouraged banks to extend credit only to state-owned or -controlled enterprises.²⁰⁵ Chinese banks are restrained by several government policy restrictions: loan-to-deposit ratios, reserve requirements, provisioning ratios, and capital requirements.²⁰⁶ To further control the amount and distribution of system-wide credit, Chinese banking regulators also use “Window Guidance” to impose lending restrictions on banks.²⁰⁷ For years, credit facilitated by Chinese banks has been largely channeled to state-controlled enterprises.²⁰⁸ Other financial institutions, such as trust companies, are not subject to such constraints.²⁰⁹ Cash-rich enterprises began to use trust companies as lending agents because they are prohibited by law from lending

²⁰⁴ Baba, McCauley & Ramaswamy, *supra* note 170, at 68–69 (Explaining MMFs invest in short-term, high-credit quality debt instruments, which usually allow depositors’ investments to be withdrawn with minimal notice and therefore require a strong liquidity position to be maintained to satisfy potential redemptions. This highlights the reason that “MMFs are important providers of liquidity to financial intermediaries through purchases of certificates of deposit (CDs) and commercial paper (CP) issued by banks, and through repo transactions.”); see Patrick Scott, *How the World’s Central Banks Have Set Interest Rates Since the Financial Crisis—In One Chart*, THE TELEGRAPH (Mar. 15, 2017), <http://www.telegraph.co.uk/business/2017/03/15/worlds-central-banks-have-set-interest-rates-since-financial/> [http://perma.cc/GM64-2MHZ].

²⁰⁵ See MCKINSEY & CO., THE COMING TRANSFORMATION OF CHINA’S TRUST INDUSTRY—CHINA’S TRUST INDUSTRY REPORT 2013 12 (2013), <http://mckinseychina.com/wp-content/uploads/2013/12/mckinsey-china-the-coming-transformation-of-chinas-trust-industry.pdf>.

²⁰⁶ See DOUGLAS ELLIOTT ET AL., THE BROOKINGS INST., SHADOW BANKING IN CHINA: A PRIMER 1 (2015), www.brookings.edu/wp-content/uploads/2016/06/shadow_banking_china_elliott_kroeber_yu.pdf.

²⁰⁷ For how Window Guidance is vigorously used in China by banking regulators, see HE WEI PING, BANKING REGULATION IN CHINA: THE ROLE OF PUBLIC AND PRIVATE SECTORS 66–67 (2014).

²⁰⁸ See generally Daikuan Tongze (贷款通则) [General Rules for Loans] (promulgated by the People’s Bank of China, June 28, 1996, effective Aug. 1, 1996), www.lawinfochina.com/display.aspx?lib=law&id=9133&CGid [https://perma.cc/9DZ4-RC8A].

²⁰⁹ See generally MCKINSEY & CO., *supra* note 205.

directly to other enterprises.²¹⁰ The loan made by a trust company or bank on behalf of an enterprise is called an ‘entrusted loan’ under the Chinese regulatory regime.²¹¹ Similar to cash-rich enterprises, banks began using trust companies to make loans and evade lending restrictions.²¹² Such regulatory arbitrage is called ‘Bank-Trust Cooperation,’ and has been the main theme of the country’s regulatory focus for the past few years.²¹³

Thus, shadow banking is not only a product of an inefficient financial market, but also of the macro-and micro-prudential policy of regulatory arbitrage.²¹⁴ Only when the negative incentive or consequence of a prudential policy is fully understood and corrected can the feedback loop of shadow banking stop reinforcing itself to an unsustainable extent. Reining in shadow banking without considering monetary and prudential policy could be akin to fighting fire by adding firewood—the impact spreads more broadly beyond the intended target area.

E. Failure to Address Cognitive Bias and Misaligned Incentives

Using heuristics to guide decision-making is not only easy and efficient, but is the best means to deal with an unknown future.²¹⁵ Financial professionals are often guided by heuristics²¹⁶ such as availability bias,²¹⁷ optimal bias,²¹⁸ and overconfidence bias.²¹⁹

²¹⁰ *See id.*

²¹¹ *Id.*

²¹² *See* Nicholas Zhu & Jurgen Conrad, *The People’s Republic of China: Knowledge Work on Shadow Banking—Trust Funds and Wealth Management Products*, ASIAN DEV. BANK (2014), <https://www.adb.org/sites/default/files/project-document/80950/shadow-banking-trust-funds-and-wmps-prc.pdf> [<http://perma.cc/PN4P-KPQG>].

²¹³ *See id.*

²¹⁴ *See id.*

²¹⁵ *See* Schwarcz & Chang, *supra* note 47, at 782.

²¹⁶ *See* Anabtawi & Schwarcz, *supra* note 34, at 1366.

²¹⁷ *Id.* at 1366–67 (“[Availability bias] reflects the tendency of a recent of especially vivid event to be the most readily accessible example in a person’s mind.”).

²¹⁸ *Id.* at 1366 (“One relevant tendency, ‘optimism bias,’ is the observed pattern that people are unrealistically optimistic about the outcomes of uncertain events.”).

Heuristics provide decision-makers with a sense of comfort because decisions are guided by widely-used processes.²²⁰ However, blind reliance on heuristics is dangerous, as the foundations of these “rules of thumb” are usually biased.²²¹ Collective inattention to these cognitive biases may cause repeated erroneous decisions.

Pursuing the maximization of self-interest is reasonable and legitimate, but disregarding the commonality of resources can result in a collective loss.²²² This reflects misaligned individual and collective incentives and is partly attributable to ineffectual regulation.²²³ Misaligned incentives are ubiquitous in financial markets.²²⁴ A prime example is the pre-GFC securitization process in which originating banks had no incentive to maintain strong loan underwriting standards because the risk of default was passed to other investors.²²⁵ Regulations such as requiring “skin in the game” (mandating that “sellers of securitization products . . . retain a minimum unhedged position in each class of securities they sell”) can address misaligned incentives.²²⁶ Failure to adequately do so prompts increasingly complex regulatory responses.²²⁷

The expectation of bailouts by taxpayers is another type of distorted incentive.²²⁸ This motivates banks to take excessive risks in anticipation of being saved should things go wrong.²²⁹ A well-crafted

²¹⁹ Simon Gervais & Terrance Odean, *Learning to Be Overconfident*, 14 REV. FIN. STUD. 1, 1 (2001) (explaining individuals tend to overestimate the degree to which they are responsible for their own success, which can create overconfident traders).

²²⁰ *Id.*

²²¹ *Id.*

²²² See Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244 (1968).

²²³ See *id.*

²²⁴ For the origin of the concept “tragedy of the commons,” see Hardin, *supra* note 222, at 1244.

²²⁵ See Schwarcz, *supra* note 6, at 824 (“In a financial market context, where too many owners (e.g., investors) have rights in a scarce resource (a class of securities), no single investor will have a sufficient amount at risk to individually motivate monitoring.”).

²²⁶ *Id.* at 820.

²²⁷ See *id.* at 820–21.

²²⁸ See Ran Duchin & Denis Sosyura, *Safer Ratios, Riskier Portfolios: Bank’s Response to Government Aid*, 113 J. FIN. ECON. 1, 23 (2014).

²²⁹ See *id.*

bail-in regime could mitigate such expectations, because creditors and shareholders will be incentivized to monitor banks' behavior more closely.²³⁰ Before the GFC, little attention was given to cognitive biases and misaligned incentives. By moving loans off their balance sheets, commercial banks could “reduce the amount of capital they were required to hold as protection against losses, thereby improving their earnings.”²³¹ Securitization enabled banks to “rely less on deposits for funding, because selling securities generated cash that could be used to make loans.”²³² The strategy of Countrywide Financial Corporation, a major U.S. mortgage originator before the GFC, was to “origin[ate] what was saleable in the secondary market[,]”²³³ as evidenced by having “sold or securitized 87% of the 1.5 trillion in mortgages it originated between 2002 and 2005.”²³⁴ For investment banks, issuing mortgage-backed securities could generate considerable fees because these securities were customized to investors' needs and therefore more diversified.²³⁵ For investors, “[p]urchasers of the safer tranches g[et] a higher rate of return than ultra-safe Treasury notes without much extra risk”²³⁶

Securitization seemed to be universally beneficial, particularly amid a fallacious perception—a type of cognitive bias—that housing prices would perpetually rise.²³⁷ If home prices could have perpetually risen, subprime borrowers would have been able to continually roll over their loans, and MBS investors could have disregarded default risk, as loans could always be called back in full through foreclosures.²³⁸ Yet, there is no way that home prices can perpetually

²³⁰ For an example of “bail-in” regulations, see Guarascio, *infra* note 312.

²³¹ Inquiry Report, *supra* note 109, at 43.

²³² *Id.*

²³³ *Id.* at 105.

²³⁴ *Id.*

²³⁵ *Id.* at 43.

²³⁶ *Id.*

²³⁷ When interviewed by the U.S. Financial Crisis Inquiry Commission, Jamie Dimon, CEO of JPMorgan Chase, told the Commission that “[i]n mortgage underwriting, somehow we just missed, you know, that home prices don’t go up forever and that it’s not sufficient to have stated income.” *Id.* at 111.

²³⁸ This widely subscribed misperception was exactly what Schwarcz termed as “a multiple human thought processing failure.” Steven L. Schwarcz, *Marginalizing Risk*, 89 WASH. U. L. REV. 487, 501–02 (2012) (“[T]he seeds of the financial crisis were planted when mortgage lenders began making

rise. Thus, a lack of incentive for mortgage lenders to comply with strong underwriting standards, and for investment banks not to pay improperly handsome fees to ratings agencies for their desired ratings, finally became detrimental to the wider economy.²³⁹ On the other hand, the complex chain of intermediation that securitization creates led to a serious fragmentation problem.²⁴⁰ As Kathryn Judge put it:

The degree of fragmentation becomes evident by taking the perspective of one of the seven thousand subprime borrowers. His loan was pooled with seven thousand other home loans in a highly complex MBS structure, which likely used overcollateralization and other dynamic credit-enhancement mechanisms. As a result, the rights of any MBS holder to the interest and principal that homeowner is paying depends in part on whether the seven thousand other homeowners are making their payments on time. Moreover, some of the securities issued in that MBS transaction went through a second fragmentation node—the billion-dollar CDO created by another bank earlier in 2005—at which stage, the cash flows from those MBSs were pooled with cash flows from 154 other MBS tranches and 40 CDOs, and then allocated according to another complicated waterfall.²⁴¹

Such a complex and fragmented structure amplified the cognitive bias of every participant in the securitization transaction chain. Sub-prime borrowers believed they could roll over their mortgages, even though they were hardly able to pay back the loans.²⁴² Mortgage lenders believed it was harmless to engage in high loan-to-value and low-documentation lending²⁴³ as long as they were able to

loans to risky borrowers secured by the homes that the borrowers purchased.”).

²³⁹ Inquiry Report, *supra* note 109, at 43–44.

²⁴⁰ See Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk*, 64 STAN. L. REV. 657, 683–84 (2012).

²⁴¹ *Id.*

²⁴² *Id.*

²⁴³ See Inquiry Report *supra* note 109, at 110.

sell the potentially toxic loans to securitization aggregators or sponsors.²⁴⁴ Aggregators believed they could reduce and diversify default risk by innovation in securities tranches.²⁴⁵ End investors believed they could blindly rely on rating agencies to determine the risk of a specific type of MBS or CDO, as their economic stake was so fragmented, and the structure was so complex.²⁴⁶ Every participant in the chain became complacent because these fragmented structures promoted false confidence that led them to believe they were so remotely exposed to risk that it hardly mattered.²⁴⁷ Collective bias and distorted incentives ended in crisis, and will do so again if not adequately addressed.

F. Overemphasis on Complex Regulations

Granular and discretion-free rules are sometimes necessary if the room for regulatory arbitrage is to be minimized. Nonetheless, regulating to a point where complete compliance is almost impossible should be avoided. In the United States, post-GFC financial reform has become a battlefield of complex, lengthy, and conflicting rules.²⁴⁸ Globally, international standards-setting bodies such as the Basel Committee on Banking Supervision (BCBS) produce complex, lengthy accords and consultative documents, and this arrangement appears likely to continue.²⁴⁹

Overreliance on complex regulations is a “sin” in today’s finance. Complex regulations not only make compliance and supervision costly and unmanageable, they also create complacency

²⁴⁴ *Id.* at xxiv.

²⁴⁵ *Id.* at 43.

²⁴⁶ Judge, *supra* note 240, at 684 (“Each of the securitization transactions described above creates fragmented economic rights with respect to the assets underlying that securitization. As a result, each MBS or CDO investor generally has only a small economic stake in the performance of any particular asset underlying that investment.”).

²⁴⁷ *Id.*

²⁴⁸ Andrew G. Haldane, Exec. Dir., Financial Stability, Bank of Eng., & Vasileios Madouros, Economist, Bank of Eng., Address at the Federal Reserve Bank of Kansas City’s 366th Economic Policy Symposium: The Dog and the Frisbee (Aug. 31, 2012) (transcript available at <http://www.bis.org/review/r120905a.pdf>).

²⁴⁹ *Id.*

among regulators.²⁵⁰ These issues are exacerbated when regulators are themselves ultra-large and complex financial behemoths.²⁵¹ Large banks are unable to internalize complex regulations, and regulators have insufficient resources to oversee their implementation. In addition, complex joint rulemaking creates potential conflict among agencies, and scope for arbitrage by the industry. The Volcker Rule is a prime example.²⁵² Aside from its final regulations being hundreds of pages in length, the rulemaking process involves five different agencies: the Federal Deposit Insurance Corporation, the Federal Reserve Board, the Office of the Comptroller of the Currency, the Securities & Exchange Commission, and the Commodities Futures Trading Commission.²⁵³ Effective regulatory regimes should deliver concrete, direct, and leeway-free messages to the industry.²⁵⁴

G. Failure to Promote Moral Restraint and Professional Standards

Worldwide financial institutions have been involved in a variety of scandals since the onset of the GFC. The largest U.S. bank, JPMorgan Chase, has spent 13 billion dollars in settling claims related to mortgage fraud charges brought by the Department of Justice.²⁵⁵ Bank of America was also held liable for fraud related to defective mortgages sold by its Countrywide unit.²⁵⁶ Other cases of “lenders

²⁵⁰ *Id.*; see also Karen Shaw Petrou, Managing Partner, Fed. Fin. Analytics, Inc., Remarks Prepared for the Securities Industry & Financial Markets Association: The Complexity-Risk Conundrum: Why SIFIs Can’t Be Both Bullet-Proof and Profit-Making (Jan. 10, 2012) (transcript available at http://www.fedfin.com/~fedfin/images/stories/press_center/sifma_speech.pdf) (using the term “complexity risk” to denote risks that arise as a result of convoluted and complex regulations).

²⁵¹ *Id.*

²⁵² See, e.g., 12 C.F.R. § 248 (2014).

²⁵³ *Id.*

²⁵⁴ For how a simpler regulatory regime can be achieved, see Haldane & Madouros, *supra* note 248.

²⁵⁵ Neil Irwin, *Everything You Need to Know About JPMorgan’s \$13 Billion Settlement*, WASH. POST (Nov. 19, 2013), <http://www.washingtonpost.com/blogs/wonkblog/wp/2013/10/21/everything-you-need-to-know-about-jpmorgans-13-billion-settlement/>.

²⁵⁶ Landon Thomas Jr., *Jury Finds Bank of America Liable in Mortgage Case*, N.Y. TIMES: DEALBOOK (Oct. 23, 2013, 6:17 PM), <http://dealbook>.

enticing homebuyers into unsuitable mortgage arrangements[,]”²⁵⁷ financial firms creating non-transparent and incomprehensible financial products, rating agencies involved in massive conflicts of interests by issuing biased ratings, and banks instituting inappropriate compensation schemes that rewarded executives for excessive risk-taking²⁵⁸ all show a serious lack of moral restraint and professional standards in financial markets.

Kevin Jackson observes the causes of the GFC through the lens of the moral-cultural mental model and concludes that:

Several causes of the present economic crisis, particularly financial innovation and complexity, excessive executive compensation, and neglect of moral hazard, are seen to be rooted in deep-seated moral-cultural tendencies. Most notable among these are technocratic and dehumanized economic thinking, egoistic individualism, greed, short-termism, rejection of objective moral values, and a highly speculative culture.²⁵⁹

These moral-cultural tendencies can be seen not only as an industry-wide disrespect of virtue, human dignity, and the common good, but also as a general failure of responsibility in business institutions and in their wider culture.²⁶⁰ Another direct symptom of these moral failures is a lack of professional standards in today’s banking industry. As uncovered by the report “Changing Banking for Good” of the U.K. Parliamentary Commission on Banking Standards (U.K. Banking Standards Commission):

Too many bankers, especially at the most senior levels, have operated in an environment with insufficient personal responsibility. Top bankers

nytimes.com/2013/10/23/jury-finds-bank-of-america-liable-in-mortgage-case-nicknamed-the-hustle/.

²⁵⁷ Kevin T. Jackson, *The Scandal Beneath the Financial Crisis: Getting a View from a Moral-Cultural Mental Model*, 33 HARV. J. L. & PUB. POL’Y 735, 755 (2010).

²⁵⁸ *Id.* at 755–56.

²⁵⁹ *Id.* at 738–39.

²⁶⁰ *Id.* at 759–64.

dodged accountability for failings on their watch by claiming ignorance or hiding behind collective decision-making. They then faced little realistic prospect of financial penalties or more serious sanctions commensurate with the severity of the failures with which they were associated. Individual incentives have not been consistent with high collective standards, often the opposite.²⁶¹

Surprisingly, unlike other professions, the banking industry essentially has no minimum standards of ethics and skills for bankers.²⁶² The lack of a set professional standards for bankers not only means that anyone who wishes to be a banker need do no more than work at a bank, but also the lack of a value and cultural system has the potential to erode bankers' consciousness of integrity and honor.²⁶³ The situation is exacerbated by inadequate compensation schemes.²⁶⁴ The U.K. Banking Standards Commission observed that poorly designed remuneration schemes have "incentivized misconduct and excessive risk-taking, reinforcing a culture where poor standards were often considered normal. Many bank staff have been paid too much for doing the wrong things, with bonuses awarded and paid before the long-term consequences become apparent."²⁶⁵

The current emphasis on "business ethics" or "corporate social responsibility" in corporate law adequately addresses a lack of professional banking standards.²⁶⁶ However, in reality, business ethics have become mere "image-conscious market[ing] strategies"²⁶⁷ adopted by the corporate sector. Moreover, social responsibility has been channeled to serve politically-correct agendas, such as

²⁶¹ U.K. PARLIAMENTARY COMM. ON BANKING STANDARDS, CHANGING BANKING FOR GOOD HC 175, 8 (2013).

²⁶² See Richard J. Parsons, *Let's Establish Professional Standards for Bankers*, AM. BANKER (Oct. 5, 2012, 9:00 AM), <http://www.americanbanker.com/bankthink/lets-establish-professional-standards-for-bankers-1053274-1.html> [<http://perma.cc/5QL2-8LKB>].

²⁶³ *Id.*

²⁶⁴ See, e.g., U.K. PARLIAMENTARY COMM. ON BANKING STANDARDS, *supra* note 261, at 9.

²⁶⁵ *Id.*

²⁶⁶ Jackson, *supra* note 257, at 758.

²⁶⁷ See *id.* at 757–58.

sustainability and environmental protection, multiculturalism, diversity, and so on.²⁶⁸ None of these thrusts aim to promote reputational and social capital that will restore faith and trust in the financial industry.²⁶⁹ They also fail to teach bankers the ability to distinguish moral right from wrong.

Only by establishing professional banking standards, and a professional body that facilitates compliance with these standards, can a culture of moral restraint and prudent behavior become entrenched in the industry.²⁷⁰ Entrenchment entails “introducing non-financial incentives, which nonetheless have financial implications, such as peer pressure and the potential to shame and discipline miscreants.”²⁷¹ Failure to entrench moral restraint and professional banking standards may nullify efforts aimed at correcting distorted incentives because there are always “golden opportunities” for individuals or firms to pursue self-interest.²⁷² A disinclination to behave opportunistically comes from something other than incentives; it is the manifestation of a habituated moral and cultural foundation.²⁷³

IV. Post-Crisis Regulatory Developments and the Seven Deadly Sins

Post-GFC financial regulations have substantially addressed the Seven Deadly Sins.²⁷⁴ While some address specific “sins,” others

²⁶⁸ *Id.* at 758.

²⁶⁹ *Id.* at 44.

²⁷⁰ See DAVID C. ROSE, THE MORAL FOUNDATION OF ECONOMIC BEHAVIOR 53–55, 204–222 (2011); U.K. PARLIAMENTARY COMM. ON BANKING STANDARDS, *supra* note 261, at 44.

²⁷¹ U.K. PARLIAMENTARY COMM. ON BANKING STANDARDS, *supra* note 261, at 44.

²⁷² For the definition of golden opportunity and its relationship with trust, see DAVID C. ROSE, *supra* note 270, at 53–55.

²⁷³ *Id.* at 204–22.

²⁷⁴ See, e.g., 12 U.S.C. § 1851; HM TREASURY, BANKING REFORM: DELIVERING STABILITY AND SUPPORTING A SUSTAINABLE ECONOMY (2012) (UK) [hereinafter UK WHITE PAPER], https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32556/whitepaper_banking_reform_140512.pdf; THE EUR. COMM’N, HIGH-LEVEL EXPERT GROUP ON REFORMING THE STRUCTURE OF THE EU BANKING SECTOR: FINAL REPORT (2012), https://ec.europa.eu/info/system/files/liikanen-report-02102012_en.pdf. [hereinafter LIIKANEN REPORT].

apply more generally. These measures, like speed limit requirements which aim to reduce the likelihood of an incident/crisis and the damage that would occur through quantifying mechanisms, generally have two problems.²⁷⁵ First, it is difficult to determine a reasonable level of capital and leverage.²⁷⁶ Second, any target-based monetary policy or financial regulation may violate “Goodhart’s Law,”²⁷⁷ the theory which states that once an economic regulation sets a specific target, it will become self-defeating and cease to be a good measure for policymaking.²⁷⁸ A target intended to enhance loss-absorbance capacity may be ‘gamed’ by banks that instead increase their holdings of risky assets.²⁷⁹

Other measures that target excessive risk-taking culture are “ring-fencing” types of reforms or reform proposals, such as the Vickers Report (which proposes a ring-fence that separates retail banking from investment banking and certain corporate finance activities),²⁸⁰ HM Treasury White Paper (which takes forward the implementation of Vickers Report recommendations),²⁸¹ the Volcker Rule (which prohibits insured depository institutions from engaging in proprietary trading and from having certain relations with hedge funds or private equity funds), and the Liikanen Report (which proposes a

²⁷⁵ Lawrence G. Baxter, *Götterdämmerung*, 18 N.C. BANK. INST. 91, 97 (2014).

²⁷⁶ See Schwarcz, *supra* note 4, at 211, 224.

²⁷⁷ For the origin of Goodhart’s Law, see Charles Goodhart, *Problems of Monetary Management: The U.K. Experience*, in 1 PAPERS IN MONETARY ECONOMICS (RES. BANK OF AUSTL., 1975). Goodhart’s Law can also be understood in the context of complexity science. Dirk Helbing, *Systemic Risk in Society and Economics*, in THE EMERGENCE OF RISKS: CONTRIBUTING FACTORS 8 (INT’L RISK GOV. COUNCIL, 2010), http://irgc.org/IMG/pdf/Systemic_Risks_Helbing2.pdf (observing Goodhart’s law as a generalization of self-fulfilling and self-destroying prophecy effects).

²⁷⁸ *Baxter Discusses Financial Regulation in Europe, Asia*, DUKE L. NEWS (Oct. 3, 2012), <https://law.duke.edu/news/baxter-discusses-financial-regulation-europe-asia/> [<https://perma.cc/M2WV-RXWC>].

²⁷⁹ *Id.*

²⁸⁰ For a brief summary of the Vickers Report, see TIMOTHY EDMONDS, HOUSE OF COMMONS LIBRARY, SNBT 6171, THE INDEPENDENT COMMISSION ON BANKING: THE VICKERS REPORT (2013), <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN06171#fullreport>.

²⁸¹ UK WHITE PAPER, *supra* note 274.

legal separation of certain risky financial activities such as proprietary trading from deposit-taking entities within the banking group).²⁸² The intention of these proposals is generally to prohibit banks that accept retail deposits from undertaking activities not directly connected to providing payment services and granting loans, thereby separating custodian and retail banking from more risky trading and investing.²⁸³

Despite their potential value, “ring-fencing alike” proposals may be problematic because they introduce extra regulatory complexity into the financial system, and because clear-cut separation might not exist in the era of big finance.²⁸⁴

A. Efforts to Reduce Reliance on Short-Term Funding

Several measures may reduce an excessive reliance on short-term wholesale funding (STF) in order to address the second “sin.”²⁸⁵ One, newly-imposed rules require banks to increase the capital held against assets on their trading books.²⁸⁶ Two, Basel III’s Liquidity Coverage Ratio requires a buffer of high-quality liquid assets, “when they use SFT liabilities that mature in less than 30 days to fund many types of security.”²⁸⁷ Three, the Federal Reserve has significantly reduced reliance on intraday credit in the tri-party repo market, as the amount of intraday credit provided by clearing banks has been reduced from 100 percent to approximately 30 percent.²⁸⁸ Four, the Financial Stability Board (FSB) has recommended imposing haircuts and margin requirements on SFTs.²⁸⁹ Firms wanting to borrow against a security

²⁸² See LIIKANEN REPORT, *supra* note 274.

²⁸³ Baxter, *supra* note 275, at 98 (“All major financial centers have toyed with structural reforms designed to separate more volatile risks from the basic business of banking. In the United States, the Volcker Rule attempts to separate banking from proprietary trading. In the United Kingdom, ‘ring-fencing’ reforms modeled on the Vickers Report are designed to shield depositor funds from high-risk activities within the banking conglomerate. In Europe, the Liikanen Commission has proposed a slightly different model.”).

²⁸⁴ *See id.*

²⁸⁵ *See* Tarullo, *supra* note 155.

²⁸⁶ *Id.* at 10–11.

²⁸⁷ *Id.* at 10.

²⁸⁸ *Id.* at 7.

²⁸⁹ *Id.* at 14 (“Over the past two years, the Financial Stability Board (FSB) has been evaluating proposals for a system of haircuts and margin requirements for SFTs. In its broadest form, a system of numerical floors for SFT haircuts

must post an excess margin according to the asset-class of the collateral.²⁹⁰ These requirements can limit “the build up of leverage at the security level, and could mitigate the risk of procyclical margin calls.”²⁹¹ Finally, transaction imposts under the Financial Transactions Tax may encourage a cultural shift from short-term-trading toward long-term investing.

Though feasible, none of these reforms seem to have completely transformed the overreliance on short-term wholesale funding. For example, the FSB’s market-wide application of margin and haircut requirements has been set at a relatively low level, and is largely unsettled.²⁹² Also, the “Liquidity Coverage Ratio” (LCR) does not necessarily consider SFT liabilities that mature in more than 30 days, so longer-term SFT liabilities remain a source of risk.²⁹³ Finally, a “Robin Hood Tax” is not likely to achieve its claimed value.²⁹⁴ A study of New York State’s securities transaction tax from 1932 to 1981 found that the tax actually increased trading volatility by as much as 10 percent, rather than reducing it as anticipated.²⁹⁵

B. Efforts to Cure Deficiency in Hedging Tools

Hedging tools may be improved on two levels. First is the improvement of institutions’ hedging abilities. The second level is more fundamental and tries to identify the dividing line between hedging and proprietary trading. Only when a firm understands where that line is can it be confident that it is hedging against risk instead of creating further risk.

Little has been done at the first level, but considerable regulatory effort has been put into the second. The Volcker Rule is

would require any entity that wants to borrow against any security to post a minimum amount of excess margin that would vary depending on the asset class of the collateral.”).

²⁹⁰ *See id.*

²⁹¹ *Id.* at 15.

²⁹² *Id.*

²⁹³ *Id.* at 11.

²⁹⁴ Steven M. Davidoff, *In Wall St. Tax, a Simple Idea but Unintended Consequences*, N.Y. TIMES: DEALBOOK (Feb. 26, 2013, 5:20 PM), <http://dealbook.nytimes.com/2013/02/26/in-wall-street-tax-a-simple-idea-with-unintended-consequences/>.

²⁹⁵ *Id.*

probably the most ambitious attempt to sort out the intricate relationships between hedging and other activities. Yet despite the ambition and good intention of the rule, the Volcker Rule is widely regarded as too complex to implement and may well have raised more questions than it supposedly answers.²⁹⁶ J.P. Morgan's "London Whale" scandal demonstrates how difficult it is for even senior management to distinguish hedging from speculative trading.²⁹⁷

C. Efforts to Understand and Better Regulate Shadow Banking

Initiatives aimed at better understanding and regulating the shadow banking system have been made at three levels. First, policy initiatives led by the FSB that aim to establish a system-wide monitoring framework to track financial-sector development outside the shadow banking system,²⁹⁸ and to coordinate policy development in five areas where oversight has to be strengthened.²⁹⁹ Second, debate among central bankers about whether the financial safety net should be

²⁹⁶ For example, even the "father" of the Volcker Rule, Paul Volcker, seems to have agreed, during a university talk in Singapore, the proposed rule is too complicated, saying, "It's much more complicated than I would like to see." Rachel Armstrong, *Paul Volcker Says Volcker Rule Too Complicated*, REUTERS (Nov. 9, 2011), <https://www.reuters.com/article/us-regulation-volcker/paul-volcker-says-volcker-rule-too-complicated-idUSTRE7A83KN20111109> [<https://perma.cc/JED7-CBJ4>]. The former FDIC Chairwoman, Sheila Bair, shared Mr. Volcker's concern. She noted in a testimony delivered before the Senate Banking Committee, "I fear that the recently proposed regulation to implement the Volcker Rule is extraordinarily complex and tries too hard to slice and dice these exceptions in a way that could arguably permit high risk proprietary trading in an insured bank while restricting legitimate market making activities in securities affiliates." *A New Regime for Regulating Large, Complex Financial Institutions, Hearing Before the S. Comm. on Banking, Hous., and Urban Affairs*, 112th Cong. (2011) (statement of Sheila Bair, Chairwoman, FDIC).

²⁹⁷ See Gina-Gail S. Fletcher, *Hazardous Hedging: The (Unacknowledged) Risks of Hedging with Credit Derivatives*, 33 REV. BANKING & FIN. L. 813, 817–18 (2014).

²⁹⁸ See FIN. STABILITY BD., *supra* note 189, at 1.

²⁹⁹ *Id.*

broadened to cover shadow banking. Third, local initiatives aimed at reducing the risks posed by shadow-banking entities or activities.³⁰⁰

A clear view of the feedback loop of the shadow-banking system requires sufficient transparency of financial institutions' maturity transformations and a sophisticated assessment of the unintended consequences of change in micro- and macro-prudential policy. Full transparency of maturity transformations will allow regulators to anticipate potential retail or wholesale runs, and to implement preventive measures. However, a sophisticated assessment of the unintended consequences of regulatory change will reduce the likelihood of regulatory change that may dampen the pro-cyclicality of the financial system.

Shadow banking operates differently in emerging markets than in developed markets. Current reform on a global level focuses largely on Western-style entities and activities, such as MMFs, repos, and securitization.³⁰¹ However, it is trust companies, wealth management, small loan companies, and online P2P lending platforms that pose the greatest risks in emerging markets.³⁰² Shadow banking is, in the present author's viewpoint, driven by essentially three factors: financial innovation, regulatory arbitrage, and misallocated credit. Policymakers should remain cognizant that market and technology developments that foster innovation are different in emerging markets.³⁰³ Further, the regulatory environment in emerging and

³⁰⁰ *Id.* at 2.

³⁰¹ See ELLIOTT ET AL., *supra* note 206, at 21.

³⁰² For instance, for a comprehensive review of the Chinese shadow banking system, see ZHONGGUO YINGZI JINRONG TIXI YANJIU BAOGAO (中国影子金融体系研究报告) [THE RESEARCH REPORT ON SHADOW BANKING SYSTEM IN CHINA] 6, 38, 41 (Li Jianjun, Sara Hsu & Tian Guangning eds., 2012); YAN QINGMIN & LI JIANHUA (阎庆民、李建华), ZHONGGUO YINGZI YINHANG JIANGUAN YANJIU (中国影子银行监管研究) [RESEARCH ON THE REGULATION OF CHINA'S SHADOW BANKING] 48 (2014). The authors of this book were the Vice Chairman of the CBRC and the Director of the Non-Bank Unit of the CBRC, respectively.

³⁰³ For example, the way China's financial market has been shaped is quite distinctive from that of western developed economies. For how technological advancement and financial repression are shaping the evolution of China's digital financial services market, see Weihuan Zhou, Douglas Arner & Ross Buckley, *Regulation of Digital Financial Service in China: Last Mover Advantage?*, 8 TSINGHUA CHINA L. REV. 25, 28–41 (2015).

developed markets is dissimilar.³⁰⁴ Lastly, economic demographics and financial market sophistication is distinctive in non-Western developing economies.³⁰⁵ For example, it is not uncommon to see non-Western developing countries still lacking a sophisticated multilayer capital market where diverse credit needs can be efficiently satisfied through different channels, and the level of literacy and sophistication of financial consumers in these markets remains to be improved. Hence, the regulation of shadow banking is context-dependent and should reflect regional differences.

D. Efforts to Address Misaligned Incentives and Cognitive Bias

Little has come from the official sector to counterbalance misaligned incentives and correct cognitive bias, aside from the idea of requiring a minimum amount of subordinated debt-like instruments that can convert automatically into equity. These instruments are widely referred to as “Contingent Convertible Bonds” (CoCos).³⁰⁶

CoCos are hybrid capital securities or bonds that absorb losses either by being written down or converted into common shares when a predefined trigger event occurs.³⁰⁷ CoCos are referred to as “convertible,” but are widely perceived to include securities that have a “write-down nature.”³⁰⁸ CoCo is also used interchangeably with “bail-in debt” and “contingent capital.” A slight nuance is that, in the context of post-GFC banking regulation, “bail-in” usually refers to the statutory power to convert debt to equity upon the occurrence of certain triggers without obtaining the consent of creditors, whereas

³⁰⁴ *See id.*

³⁰⁵ *See* ELLIOTT ET AL., *supra* note 206, at 21.

³⁰⁶ For a comprehensive overview of the structure and design of CoCos, see Stefan Avdjiev, Anastasia Kartasheva & Bilyana Boganova, *CoCos: A Primer*, BIS Q. REV., 43, 43 (2013).

³⁰⁷ *Id.* at 44–45 (“CoCos are hybrid capital securities that absorb losses in accordance with their contractual terms when the capital of the issuing bank falls below a certain level. Then debt is reduced and bank capitalization gets a boost. Owing to their capacity to absorb losses, CoCos have the potential to satisfy regulatory capital requirements.”).

³⁰⁸ *Id.* at 46 (“Most PWD CoCos have a full writedown feature. However, there are exceptions. For example, in the case of the CoCo bond issued by Rabobank in March 2010, holders of CoCos would lose 75% of the face value and receive the remaining 25% in cash.”).

“CoCos” or “contingent capital,” generally refers to instruments that convert from debt to equity upon contractually agreed triggers.³⁰⁹

The BCBS has set out the requirements for CoCos to qualify as Tier 1 or Tier 2 capital.³¹⁰ The U.S. Dodd-Frank legislation mandates the Federal Reserve to evaluate a minimum amount of contingent capital becoming part of regulatory capital requirements.³¹¹ The European Commission has also proposed standards for debt bail-ins to avoid the use of taxpayer funds.³¹²

CoCos can enhance market discipline either by incentivizing equity holders to voluntarily issue new equity before a bank risks insolvency, or by incentivizing holders to demand corrective actions before problems arise.³¹³ The former can be achieved by designing a conversion-to-equity CoCo under which a threat of pre-insolvency

³⁰⁹ See William DeCotiis & Johnathan B. Whitney, *The Atypical Creditor: How Bail-In Affect Borrowers*, LAW360 (Apr. 20, 2016, 11:09 AM), <https://www.law360.com/articles/785126/the-atypical-creditor-how-bail-in-affects-borrowers> [<https://perma.cc/AW88-YCKR>]; John C. Coffee, Jr., *Bail-Ins Versus Bail-Outs: Using Contingent Capital to Mitigate Systemic Risk 9* (Columbia Law Sch. Ctr. for Law & Econ. Studies, Working Paper No. 380, 2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1675015 [<https://perma.cc/U592-CS22>].

³¹⁰ See generally BASEL COMM. ON BANKING SUPERVISION, PROPOSAL TO ENSURE THE LOSS ABSORBENCY OF REGULATORY CAPITAL AT THE POINT OF NON-VIABILITY (2010), <https://www.bis.org/publ/bcbs174.pdf>. For those who are not familiar with the Basel III Accord, Tier 1 Capital generally consists of common equity and the so-called Additional Tier 1 Capital that has a loss-absorbing capacity on a “going concern” basis. Tier 2 Capital basically denotes capital instruments that meet a certain set of criteria and are able to provide loss absorption on a “gone-concern” basis. See generally BASEL COMM. ON BANKING SUPERVISION, BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS (2011), <https://www.bis.org/publ/bcbs189.pdf>.

³¹¹ See Coffee, *supra* note 309, at 1–2 n.3.

³¹² Francesco Guarascio, *Bank Bail-In Requirements to Be Case-by-Case, No Minimum Level—EU Draft Law*. REUTERS (May 18, 2016, 8:55 AM), <http://www.reuters.com/article/eurozone-banks-bailin/bank-bail-in-requirements-to-be-case-by-case-no-minimum-level-eu-draft-law-idUSL5N18E4PN> [<https://perma.cc/68QA-5NNK>].

³¹³ See Charles W. Calomiris & Richard J. Herring, *How to Design a Contingent Convertible Debt Requirement That Helps Solve Our Too-Big-to-Fail Problem*, 25 J. APPLIED CORP. FIN 39 (2013).

dilution to equity holders is created.³¹⁴ And the latter can be achieved when CoCo holders become more disadvantaged by a conversion event, and are therefore incentivized to force changes in banks' behaviors. Unfortunately, the way CoCos are structured so far does not bring promising potential to promote market discipline or foster better bank regulation.

E. Efforts to Reduce Regulatory Complexity

Regulatory complexity has not been adequately addressed by post-GFC reforms, but has instead worsened.³¹⁵ Despite several commentators and seasoned regulators³¹⁶ not regarding complex capital rules and rule-making processes as effective in achieving the desired outcomes, many policymakers seem to believe that the adoption of regulations that are heightened³¹⁷ and rules-based³¹⁸ are the

³¹⁴ *Id.* at 41, 46.

³¹⁵ For how complex rules and regulatory complexity adversely affect the robustness of the global regulatory framework, see Haldane & Madouros, *supra* note 248. One commentator uses the term “complexity risk” to denote risks as a result of convoluted and complex regulations. See Karen Shaw Petrou, Managing Partner, Fed. Fin. Analytics, Inc., Remarks Prepared for the Securities Industry & Financial Markets Association: The Complexity-Risk Conundrum: Why SIFIs Can't Be Both Bullet-Proof and Profit-Making (Jan. 10, 2012) (transcript available at www.fedfin.com/~fedfin/images/stories/press_center/sifma_speech.pdf).

³¹⁶ See Haldane & Madouros, *supra* note 248, at 4.

³¹⁷ For instance, in the U.S., the Federal Reserve had issued the proposed rules to implement enhanced supervisory and prudential requirements in Sections 165 and 166 of the Dodd-Frank Act, which impose more stringent prudential standards on capital and leverage requirements, liquidity requirement, and single counter party exposure limit as well as requirements for Risk Management. For a comprehensive summary of the proposed rules, see DAVIS POLK & WARDWELL LLP, SUMMARY OF THE FEDERAL RESERVE'S PROPOSED RULES FOR ENHANCED PRUDENTIAL STANDARDS AND EARLY REMEDIATION REQUIREMENTS FOR COVERED COMPANIES (2011), http://www.davispolk.com/files/Publication/c459b8b4-3b0f-4411-b2a9-5262b793b081/Presentation/PublicationAttachment/811fc1a8-ab09-4fb4-aaed-58eff57d315f/122311_Summary_Federal_Reserve_Proposed_Rules.pdf. For critical comments raised by the industry with regard to the proposed rules, see The Clearing House Ass'n, LLC et al., Comment Letter on Enhanced Prudential Standards and Early Remediation Regulations Under Dodd-Frank 165/166 (Apr. 27,

best ways to prevent further calls on taxpayers³¹⁹ and proactively ensure the safety and soundness of financial institutions.³²⁰ Such a belief is reflected in the rulemaking of Dodd-Frank and Basel III, both of which are lengthy and complex.³²¹ The key to effectively containing the escalated risk of regulatory complexity might instead lie with the revival of the market's self-disciplinary powers.

2012), https://www.federalreserve.gov/SECRS/2012/May/20120501/R-1438/R-1438_042712_107270_542775340448_1.pdf.

³¹⁸ The U.S. is generally regarded as adopting the approach of rules-based regulation. One of the most representative rules proposed in the wake of the GFC is the famous, but controversial, Volcker Rule. The Volcker Rule is set forth in section 619 of the Dodd-Frank and codified in section 13 of the Bank Holding Company Act, 12 U.S.C. § 1851 (2012). The proposed rule is at 79 Fed. Reg. 5536 (Jan. 31, 2014). The Rule is a vivid example of complex joint rulemaking. The agencies that developed the Proposed Rule are the FDIC, the FRB, the OCC, the SEC, and the CFTC. The CFTC version of the proposed rule available at <https://www.gpo.gov/fdsys/pkg/FR-2012-02-14/pdf/2012-935.pdf>. Prohibitions and Restrictions on Proprietary Trading and Certain Interests in, and Relationships With, Hedge Funds and Covered Funds, 77 Fed. Reg. 8332 (Feb. 14, 2012). One of the major criticisms of the Rule is its sheer volume, which makes it extremely difficult to be complied with by the industry. See Haldane & Madouros, *supra* note 248, at 18 (indicating “the consultation document accompanying Volcker already runs to 298 pages”).

³¹⁹ The Dodd-Frank Act was basically introduced to serve this purpose. See *Wall Street Reform: The Dodd-Frank Act*, THE WHITE HOUSE, <https://obamawhitehouse.archives.gov/economy/middle-class/dodd-frank-wall-street-reform> [<https://perma.cc/4EGQ-E66N>] (assuring “[t]axpayers will not have to bear the costs of Wall Street’s irresponsibility”).

³²⁰ In addition to the enhanced safety and soundness of financial institutions, some even argue rules-based regulation is preferable in the field of macroprudential supervision. See IMF, *Lessons of the Financial Crisis for Future Regulation of Financial Institutions and Markets and for Liquidity* (Feb. 2009), <http://www.imf.org/external/np/pp/eng/2009/020409.pdf> (advocating that rules-based framework can better address the procyclicality of existing capital requirements and other prudential norms).

³²¹ Adam J. Levitin, *The Politics of Financial Regulation and the Regulation of Financial Politics: A Review Essay*, 127 HARV. L. REV. 1991, 2030–31.

F. Efforts to Promote Moral Restraint and Professional Standards

Promoting moral restraint, adherence to professional standards, and reduced regulatory complexity are equally under-addressed. Post-GFC reform limits itself mainly to reinforcing individual responsibility and counterbalancing disincentives such as the executive compensation and corporate governance provisions of Dodd-Frank, bankers' bonus caps as part of the EU Capital Requirement Directive IV, and the say-on-pay policy initiatives in several jurisdictions.³²² These measures may help achieve the realignment of *misplaced incentives* for bankers, but will only have limited effects on endogenously transforming the *moral cognition* of bankers, not to mention to achieve a collective culture where professional accords are voluntarily observed.

V. Conclusion

The seven fundamental deficiencies in the contemporary financial system represent the miscarried pursuits of justifiable ends and are therefore not inherently wrong. Accordingly, regulation should be not pushed to an extreme where good intentions are expelled along with sins.

Risk-taking is the necessary path to profit-making, but it should not become excessive in that potential negative consequences outweigh projected profits—nor should it end in catastrophic costs. Current target-based regulatory measures, such as that of capital, leverage, and liquidity requirements, are often subject to Goodhart's

³²² See Jenny Anderson, *European Banking Authority Clarifies Rules on Pay*, N.Y. TIMES (Mar. 4, 2015), <https://www.nytimes.com/2015/03/05/business/dealbook/european-banking-authority-clarifies-rules-on-pay.html>; Alex Barker, *George Osborne Takes EU to Court Over Bank Bonus Cap*, FIN. TIMES (Sep. 25, 2013), <http://www.ft.com/intl/cms/s/0/0f54735a-25f6-11e3-8ef6-00144feab7de.html#axzz2oguDrT4j>; Paul Hodgson, *Bankers' Pay Caps Didn't Work Here, They Won't Work in Europe*, FORBES (Apr. 11, 2013, 10:48 AM), <http://www.forbes.com/sites/paulhodgson/2013/04/11/bankers-pay-caps-didnt-work-here-they-wont-work-in-europe>; Evan Weinberger, *All Banks Pass Fed's Stress Tests, But Cap One Gets Do-Over*, LAW360 (June 28, 2017, 4:38 PM), www.law360.com/articles/939139/all-banks-pass-fed-s-stress-tests-but-cap-one-gets-do-over [<https://perma.cc/M6V6-E2B8>].

Law, rendering their effectiveness easily compromised.³²³ Ring-fencing arrangements that aim to isolate the culture of excessive risk-taking, on the other hand, are simply too difficult to implement effectively in the current era of big and complex finance.³²⁴

Reliance on well operated short-term funding can facilitate market-wide credit allocation, and fulfill credit needs that are potentially beneficial to the wider economy.³²⁵ However, pushing this practice to the extreme will also subject the entire financial system to sudden to catastrophic wholesale or other types of bank-runs.³²⁶ Current regulatory initiatives appear appropriate, but their efficacy remains to be seen.

Hedging is a necessary measure to safeguard the soundness of a financial institution. However, its achievement is inherently difficult, especially in the context of complex and risky banking. Sometimes the innovative tools that help banks hedge their positions can have detrimental consequences.³²⁷ The intricate relationship between hedging and speculative trading must be first sorted out before we can then adopt novel ways of hedging. However, solving the hedging versus speculative-trading question might prove impossible.

Shadow banking activities, if properly structured and managed, can offer benefits to the wider economy by providing increased funding and liquidity, advanced efficiency, and diversification and mitigation of risks. Nonetheless, they also have the potential of posing systemic risk if they involve imperfect maturity or liquidity transformation and excessive build-up of leverage.³²⁸ Failure to understand the sources and feedback loop of shadow banking activities will adversely affect regulators' ability to respond in a timely manner to systemic events resulting from these activities.³²⁹ Maybe the best approach is to remain observant and flexible in terms of regulation-making and implementation and help the market exercise its disciplinary power through incentive-compatible market mechanisms.

Using heuristics to guide decision-making is sometimes worthwhile. However, relying on heuristics blindly is dangerous, as

³²³ See Helbing, *supra* note 277, at 8.

³²⁴ See, e.g., LIIKANEN REPORT, *supra* note 274, at 98.

³²⁵ OFF. OF FIN. RES., *supra* note 141, at 2.

³²⁶ See *id.* at 57.

³²⁷ See Schwarcz, *supra* note 174, at 494.

³²⁸ See INST. OF INT'L FIN., *supra* note 190, at 1.

³²⁹ See *id.* at 2.

the premises underlying ‘rules of thumb’ are prone to bias.³³⁰ Collective inattention to cognitive biases may bring down the financial markets and subject us to repeated erroneous decisions. Staying conscious of our cognitive tendencies, and of the negative effects these tendencies may bring, might be the only practical safeguard against the risks that cognitive biases bring to the financial system.

Detail-driven and discretion-free regulation is sometimes necessary if regulatory arbitrage is to be minimized. Nonetheless, escalated regulatory complexity should be avoided, as that may only make complete compliance impossible and but give regulators a false sense of confidence. Overreliance on complex regulations is an area that needs our urgent attention.

Finally, moral restraint and professional standards are seriously lacking in the financial industry and may be the root cause of the other “sins.” Reinforcing personal liability and counterbalancing misaligned incentives are good first steps, but will have only a limited effect on transforming the industry’s culture. Cultivating high professional standards entails embedding moral and cultural values into professional education. There needs to be a greater consciousness of the fact that moral restraint reduces regulatory costs, increases public trust, and ultimately advances business profits.

Understanding the Seven Deadly Sins in the contemporary financial system provides a start to identifying the areas where we need more regulatory effort, or greater market power to fix fundamental deficiencies. A brief review of the post-GFC reform measures highlights the blind spots we face when tackling these deficiencies. The next step is the concentration of regulatory resources in dealing with major blind spots, such as how to reduce regulatory complexity and how to raise professional standards. This would probably require a thorough re-visitation, indeed, the energetic seeking out, of the financial market’s self-rehabilitative power.

³³⁰ Schwarcz & Chang, *supra* note 47, at 771.