

AN ALTERNATIVE STORY OF THE LAW AND REGULATION OF RISK MANAGEMENT

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ABSTRACT

This Article examines the history of the regulation of risk management in the banking industry. Despite the centrality of risk management to contemporary banking law and regulation, its fundamental precepts have largely escaped scrutiny. This Article first summarizes what it means to *manage risk* and then contrasts a traditional story of risk management regulation with an alternative story. The traditional story posits that regulatory interventions are practical, functional responses to threats to the achievement of regulators' statutory mandates of system-wide financial stability and institution-level safety and soundness. In the course of summarizing this traditional account, the Article undertakes the first systematic review of the legislative and regulatory actions by which risk management became a public regulatory subject. The alternative story, by contrast, acknowledges the empirical fact of risk management as an enhanced regulatory priority, but interrogates its normative assumptions. It presents the regulatory focus on risk management as more of a cultural crutch in response to growing anxiety about endemic uncertainty in financial markets—as a reflection of the aspirations underlying the practice rather than the practice as such. Particular attention is given to how regulators have prioritized questions of *risk control* over more basic questions of *risk assessment*, and, in the process, have failed to take account of how banks and regulators view risk in different terms. Though its implications are troubling, this alternative story sheds light on where authorities should focus reform efforts to improve risk management regulation.

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INTRODUCTION

In recent decades, the regulation of risk management has become one of the key pillars of bank regulation, with Congress and bank regulators both routinely addressing the internal corporate risk management practices of banks. As early as the mid-1990s, it became plausible to refer to a “new religion” of risk management in finance.¹ Despite the centrality of risk management to banking law and regulation, its fundamental precepts have largely escaped scrutiny.² The dearth of attention to risk management regulation does not reflect a lack of relevance so much as the disorganized,

1. Peter L. Bernstein, *The New Religion of Risk Management*, HARV. BUS. REV. 47 (Mar. 1996).

2. Ben Bernanke, Chairman, Bd. of Govs. of the Fed. Reserve Sys., Remarks at the Stonier Graduate School of Banking, Washington, D.C. (Jun. 12, 2006) [hereinafter Bernanke Stonier School Remarks] available at <http://www.federalreserve.gov/newsevents/speech/bernanke20060612a.htm> (describing regulators’ review of risk management systems as the “heart of the modern bank examination”).

often confounding, manner by which authorities have addressed the issue. This article undertakes the first exploration of the dogmas and the history of this new near-religious faith on the part of public law authorities that regulated banks are able to manage and control risk. The research presented here traces how these authorities have sought to influence risk management norms and practices. It uncovers a regulatory canon that has set forth increasingly expansive mandates that bank boards of directors and senior management understand and control risks. While articulating ever-broader expectations of *risk control*, these authorities have left critically undeveloped key questions of *risk assessment*—including, most prominently, questions that touch on organizational goals and the events that threaten those goals. A troubling alternative history emerges from this study: risk management regulation is in practice more an attempt to maintain the appearance of control than an effective regulatory program promoting a managerial antidote to new sources of instability and volatility in financial markets.

Part I introduces the idea of risk management and presents a general theory of risk management. The general theory describes a broader intellectual and organizational discipline than the set of practices familiar to bank risk managers. By starting from a broad reference frame, it will be easier to identify certain idiosyncrasies, described further in Parts II and III, of contemporary risk management practice as it has been developed by industry and influenced by bank regulatory law. Risk management is presented as a two-part process consisting of risk assessment and risk control. Risk assessment describes the processes by which an organization considers its goals and explores how contingent events might affect the achievement of those goals. These processes therefore occur along a political-rhetorical dimension that asks, “*What objectives matter to the organization, and what constitutes a threat to them?*” and a descriptive-relational dimension that asks, “*In what ways do future contingent events affect the achievement of these objectives?*” Once threats to organizational goals are identified and their causal environments are explored, risk control requires an organization to put in place procedures designed to manage those threats in a consistent, reliable way.

Part II describes what I term *the traditional story of risk management*, according to which regulatory interventions are practical, functional responses to threats to the achievement of regulators’ statutory mandates of system-wide financial stability and institution-level safety and soundness. This traditional theory portrays a dynamic, dialogic process whereby regulators identify risks and vulnerabilities and deputize bank risk management departments to counteract them, producing increasingly detailed guidance and imposing ever-wider expectations along the way.

Though the story depicted here is labeled “traditional,” its proponents self-consciously advocated for and utilized non-traditional regulatory approaches. The regulatory interventions in this context eschewed conventional regulatory techniques that mandated organizational behaviors or regulated outputs. Instead, public lawmakers focused on influencing the internal bank *systems and procedures* on which financial stability and safety-and-soundness depended. Though this phenomenon is not unique to banking law and regulation, bank regulators’ approach to risk management regulation is certainly one of the most salient examples of these changing regulatory techniques.

This story begins in sub-Part A with a brief description of the development of derivatives markets, and highlights the dual nature of derivatives as both risk-reducing and risk-expanding instruments. Particular attention is given to how derivatives expand the dimensionality of risk and introduce new managerial challenges. Next, sub-Part B traces how internal controls became a subject of public law and regulation. Public law authorities increasingly came to recognize that the organizational complexity of regulated entities, both inside and outside the banking sector, increasingly required regulators to focus their attention on systems of internal control. Internal controls refer to the set of: (i) pre-defined organizational responses to particular risks; and (ii) those processes to make sure the correct responses are in fact being applied and working as intended. These regulatory interventions began in the narrow context of legal compliance and financial reporting, but private sector norms of internal control gradually expanded to direct organizations to implement systematized, rationalized approaches to all risks.

Sub-Parts C and D describe how bank regulators came to embrace a broader, more comprehensive form of risk management that went beyond internal control. In particular, sub-Part C examines bank regulatory guidance concerning risk management to be considered during the bank examination process, when regulators and bank management interface and discuss, usually informally, bank performance in the shadow of regulators’ more draconian enforcement powers. The bank examination process during this period transformed from a review of bank balance sheets and loan books to a full-fledged review of corporate risk management programs. This sub-Part analyzes selected regulatory actions and uncovers *three predominant stages of risk management regulation* during this period: (i) responsibility allocation and internal risk control; (ii) threat description and control; and (iii) construction of a system of comprehensive enterprise protection. As regulators moved through the successive stages, they set forth increasingly broad mandates for banks to understand and control risks. Sub-Part D documents how the capital adequacy regime, the linchpin

of the bank regulatory apparatus, also transformed into risk management regulation. Starting in the 1990s and continuing into the 2000s, the bank capital adequacy rules gradually came to set bank capital requirements by reference to estimates of exposures generated and used by internal risk management departments, another example of regulators attempting to shape risk management practices.

Part III presents a contrasting alternative story of risk management regulation. This alternative story acknowledges the empirical fact of risk management as an enhanced organizational and regulatory priority, but interrogates its normative assumptions. It presents the regulatory focus on risk management as more of a cultural crutch in response to growing anxiety about endemic uncertainty, framing regulation as a reflection of the aspirations underlying risk management rather than risk management as such. It sees in risk management a placeholder delimiting the range of objects that *demand organizational control* rather than the range of objects that are in fact *susceptible to such control*. According to this alternative story, it is unsurprising that research into risk management reveals what might otherwise seem a paradox: risk management is “accepted by all” in spite of a poor track record.³ Part III explains further why this equivocal record of risk management regulation results from the tendency of bank regulators to privilege risk control over fundamental, but contestable, issues that touch on risk assessment. Simplifying only slightly, regulators have commanded banks to control risk, but offer little guidance on how banks are to identify threats or how much effort banks are expected to spend exploring how those threats might materialize. Particular attention is given to: (i) how the divergent microeconomic incentives of bank management and bank regulators complicate the political-rhetorical dimension of risk assessment; and (ii) how the introduction of complexity into financial markets frustrates the descriptive-relational dimension of risk assessment. Whether risk management regulation in the banking sector will overcome the shortcomings identified by the alternative story and meet the expectations of the traditional story will depend on the extent to which regulators are able to engage the risk assessment process as such and foster a new mindful decision-making infrastructure within bank boardrooms and executive suites.

3. GRANT KIRKPATRICK, ORG. ECON. COOP. DEV., THE CORPORATE GOVERNANCE LESSONS FROM THE FINANCIAL CRISIS 6 (2009), *available at* <http://www.oecd.org/dataoecd/32/1/42229620.pdf> [hereinafter OECD CORPORATE GOVERNANCE REPORT].

I. RISK MANAGEMENT AS RISK ASSESSMENT AND RISK CONTROL

The term “risk management” is overbroad and in need of some conceptual splitting before it can be a proper subject of inquiry.⁴ In much of the financial and practitioner literature on risk management, the embedded assumptions that condition the practice of risk management in financial institutions are not acknowledged. This Part will take up the following questions: “What is *risk*?”; “What does it mean to *manage* risk?”; and “What is the role of regulators in risk management?” The general framework advocated here conceives of risk management as a two-part process. First, an organization must engage in risk assessment, a task that requires consideration of organizational goals and deliberation on how future contingent events affect achievement of those goals. The second part of risk management requires an organization to control, or manage, the risks identified and explored during the risk assessment exercise.

Any analysis of risk assessment must necessarily start with the term “risk,” which in its broadest sense is a *descriptive, relational* concept linking possible future events to observable future states of the world.⁵ Starting from this broad definition, risk analysis must begin with defining “risk objects”—i.e., those ideas about how contingencies relate causally to future harm.⁶ This basic building block of risk analysis then describes the connection between possibility and reality.⁷ A risk might exist only where a future contingency has a possibility of occurring and impacting the future in some relevant manner. With advances in statistical science and data gathering techniques, risk is increasingly expressed in quantitative terms.⁸

However, nothing prevents even those risks that are presently incapable of being analyzed in terms of probabilities from being studied and understood as a risk object in terms of cause-and-effect. When risk objects become the units of inquiry, the oft-echoed distinction between

4. See MICHAEL POWER, ORGANIZED UNCERTAINTY 3 (2007) (“Philosophers remind us to be wary of assuming that our most treasured nouns refer to anything, and this is nowhere more true than in the case of ‘risk.’”).

5. ORTWIN RENN, RISK GOVERNANCE 1-2 (2008). “Risk” is itself a highly contested concept. See Ortwin Renn, *Three Decades of Risk Research: Accomplishments and New Challenges*, 1 J. RISK RESEARCH 49, 50 (1998) [hereinafter *Accomplishments and Challenges*] (“Talking about risks faces the immediate danger that everybody talks about something different . . .”).

6. Stephen Hilgartner, *The Social Construction of Risk Objects: Or, How to Pry Open Networks of Risk*, in ORGANIZATIONS, UNCERTAINTIES AND RISKS 39 (Lee Ben Clarke & James F. Short eds. 1992).

7. *Accomplishments and Challenges*, *supra* note 5, at 51.

8. See generally THEODORE M. PORTER, TRUST IN NUMBERS (1995) (discussing the modern rise of quantification and its effect on culture).

uncertainty and risk ceases to demarcate the frontier of risk management. Even when the causal environment cannot be expressed probabilistically, it may still allow for prudential and precautionary efforts to minimize risk or counterfactual simulations to explore the impact of events. This intellectual discipline especially helps when exploring remote events with potentially catastrophic impacts.

But this descriptive-relational dimension of risk describes only part of the nature of risk. In order for a contingency to amount to a risk, it must also have a *political* and *rhetorical* dimension. For example, the movements of an ant from time T_1 to time T_2 can be measured using probabilistic analysis of cause-and-effect, but until a wager is hazarded on the whereabouts of the ant, we would not describe the ant's movements as risky. As David Garland observes, "risks never exist outside of our knowledge of them."⁹ Instead, "[t]hey are the product of future-oriented human calculations—assessments made by people in the face of an uncertain world and the possibilities that it holds for them."¹⁰ Any definition of risk therefore requires value judgments regarding which "future-oriented human calculations" should be the focus of analysis.¹¹ Values, priorities, and risk perceptions must be considered in this analysis.¹²

For example, consider how risk assessors might compare the relative riskiness of Product A, which will result in fifty deaths per year from

9. David Garland, *The Rise of Risk*, in *RISK AND MORALITY* 48, 52 (Richard Victor Ericson & Aaron Doyle eds., 2003).

10. *Id.*; see also François Ewald, *Insurance and Risk*, in *THE FOUCAULT EFFECT* 197, 199 (Graham Burchell et al. eds., 1991) ("Nothing is a risk in itself; there is no risk in reality. But on the other hand, anything *can* be a risk; it all depends on how one analyzes the danger, considers the event.").

11. Garland, *supra* note 9, at 52; see also Baruch Fischhoff et al., *Defining Risk*, 17 *POL'Y SCI.* 123, 123-24, 137 (1984) (explaining the effects of a changing definition of risk according to decision-maker or the problem he faces); cf. PETER L. BERNSTEIN, *AGAINST THE GODS: THE REMARKABLE HISTORY OF RISK* 8 (1996) ("The word 'risk' derives from the early Italian *risicare*, which means 'to dare.' In this sense, risk is a choice rather than a fate. The actions we dare to take . . . are what the story of risk is all about.").

12. See RENN, *supra* note 5, at 2-4 (discussing the debate about whether risks are socially constructed or real phenomena). Where perceptions of risk are out of step with objective scientific evidence regarding the future probabilities and harms, a key component of risk management is to bring perceptions up to date. That said,

[a] vast majority of studies on risk perception and concerns tends to show, however, that most of the worries are not related to blatant errors or poor judgment, but to divergent views about the tolerability of remaining uncertainty, short-term versus long-term impacts, the trustworthiness of risk-regulating or risk-managing agencies, and the experience of inequity or injustice with regard to the distribution of benefits and risks.

Id. at 3.

isolated malfunctions; Product B, which generally functions reliably but is prone to a single, once-in-four-years large accident causing 150 deaths; and Product C, which will never malfunction but will produce latent carcinogenic effects on all users. Here, the risk assessor has already completed the technical, probabilistic assessment of the likelihood of future state outcomes. In order to conduct a discussion about the relative risks of Product A, Product B, and Product C, however, the risk assessor must familiarize himself with matters touching on human values. He must consider, for example, whether the population prefers to take a risk that will result in the deaths of a few people regularly or a risk that will rarely, though reliably, result in the deaths of many people. This process of *risk assessment*, which is different than risk management, consists of the following analytical steps: (i) identifying future state outcomes that affect the values of the risk-assessing entity; (ii) formulating a way to measure or otherwise assess the possibilities of such outcomes; and (iii) aggregating different classes of outcomes and articulating their probabilities using language that permits comparison, priority-setting, and decision-making.¹³ Task (i) describes the political-rhetorical dimension of risk. Task (ii) relates to the causal environment linking future states to contingent events, and therefore describes the descriptive-relational dimension of risk. Task (iii) bridges risk assessment with the distinct, but critically interdependent, challenge of risk control.

Conceived of broadly, then, risk assessment includes the entire field of contingencies that affect matters of concern in recognizable ways. Thus defined, a comprehensive program of risk assessment and management would require considering the likelihood of all possible future world states that might affect outcomes of interest to the assessor.¹⁴ Once risks are assessed, questions of risk management arise concerning allocations of organizational responsibility and design of information systems for assuring risk control and monitoring consistent with risk tolerance levels.¹⁵ This new notion of management of risk necessarily entails *control* over the

13. *Accomplishments and Challenges*, *supra* note 5, at 51.

14. See Jerome R. Ravetz, *Public Perceptions of Acceptable Risks as Evidence for the Cognitive, Technical, and Social Structure*, in *TECHNOLOGICAL RISK* 45, 47 (Rob Coppock et al. eds. 1980) ("The hope that one can produce a taxonomy, evaluation, and finally a technical fix to the problems of risks is in substance as ambitious as the program of putting all of human experience and value onto a scale of measurement for mathematical or political manipulation.").

15. See Bridget M. Hutter & Michael Power, *Organizational Encounters with Risk: An Introduction*, in *ORGANIZATIONAL ENCOUNTERS WITH RISK* 1 (Bridget M. Hutter & Michael Power eds., 2005) (arguing that organizations are the principal actors in a risk society); M. Granger Morgan, *Choosing and Managing Technology-Induced Risk*, in *READINGS IN RISK* 17, 17 (Theodore S. Glickman & Michael Gough eds., 1990) (setting forth questions addressing methods to assess, abate, and manage risk).

risk objects identified during the assessment phase. A key component of any program of risk management is to maximize the range of risk objects that the manager has control over and to minimize the areas where the descriptive-relational link between contingency and future states remains hidden.¹⁶ An organization will succeed in managing risk to the extent that it is able to improve its risk assessment capabilities and maximize the range of risk objects over which it exerts control. Therefore, control, or at least the perception of control, is central to risk management.

Risk managers, particularly those working at financial institutions, might object to this characterization as too abstract and distant from their daily practice. Although this is partly true, these broad definitions of risk and risk management still provide a useful framework in which actual risk management practice and regulation can be set. By adopting this framework, it will be possible to question “the obviousness of practitioner common sense” by individuating “the processes by which that common sense was formed.”¹⁷ Financial risk is often conflated with volatility alone,¹⁸ but that approach unrealistically assumes static organizational goals and causal environments. The success of the dominant quantitative model of risk management practice in recent decades is equivocal, so by starting with first principles it might be possible to contemplate alternative modes of control that could have proven more effective at risk assessment and control.

Since the mid-1980s, commercial and regulatory developments have combined to elevate risk management (including risk assessment) to become a core management imperative in financial services. Of course, the discipline of managing uncertainty is hardly a novel moment in intellectual history. Probabilistic techniques for computing gambling odds developed in sixteenth century Italy, for example, would qualify as proto-risk management practices according to the broad framework outlined above.¹⁹ So too would the events marking the genesis of dedicated insurance

16. BERNSTEIN, *supra* note 11, at 197.

17. MICHAEL POWER, *THE AUDIT SOCIETY: RITUALS OF VERIFICATION* 8 (1997).

18. The idea that risk refers only to the quantifiable volatility of returns originated with Frank Knight in 1921. See FRANK H. KNIGHT, *RISK, UNCERTAINTY, AND PROFIT* 233 (1921) (“To preserve the distinction . . . between the measurable uncertainty and an unmeasurable one we may use the term ‘risk’ to designate the former and the term ‘uncertainty’ for the latter.”). For a discussion on why this view is unduly restrictive, see Glyn A. Holton, *Defining Risk*, 60 *FIN. ANALYSTS J.* 19, 20 (2004) (“According to common usage, risk entails both uncertainty and exposure—possible consequences. Knight’s distinction addresses only the uncertainty.”); Robert F. Weber, *A Theory for Deliberation-Oriented Stress Testing Regulation* (manuscript on file with author).

19. See DAVID A. MOSS, *WHEN ALL ELSE FAILS: GOVERNMENT AS THE ULTIMATE RISK MANAGER* 22-24 (2002) (discussing studies of gambling by Girolamo Cardano, an Italian mathematician and physician).

markets, including Edmund Halley's publication of mortality data in 1693 for the purpose of accurate pricing of annuity contracts; the birth of a casualty insurance market at Edward Lloyd's coffee house in the late seventeenth and early eighteenth centuries; and the formation of the first life insurance companies in mid-eighteenth century Scotland.²⁰ These insurance innovations were enabled by advances in statistical science during the seventeenth and eighteenth centuries that prompted confident assertions that human intelligence would soon be able to understand the entire universe in terms of cause and effect.²¹ Peter Bernstein has described the work of early statisticians Jacob Bernoulli, Abraham de Moivre, and Thomas Bayes as an "audacious" and "bold attack on the unknown."²² Even as the Enlightenment's expectations that science would uncover all causal linkages gave way to the twentieth century's recognition of the irreducible complexities of phenomena, probability theory emerged unscathed.²³

Despite its historical pedigree, risk management in its contemporary iterations seems novel due to its emergence as a subject for law and

20. See NIALL FERGUSON, *THE ASCENT OF MONEY: A FINANCIAL HISTORY OF THE WORLD 191-96* (2008) (chronicling the development of Scottish insurance products using mortality projections); Edmund Halley, *First Life Insurance Tables*, in 3 *THE WORLD OF MATHEMATICS 1437* (James R. Newman ed., 1956) [hereinafter *WORLD OF MATHEMATICS VOLUME 3*] (discussing the valuation of life insurance and annuity contracts using actuarial tables).

21. See, e.g., Pierre Simon de Laplace, *Concerning Probability*, in 2 *THE WORLD OF MATHEMATICS 1325, 1325-26* (James R. Newman ed., 1956) (arguing that all events are caused and can therefore be understood). The intellectual foundation for such assertions was laid by Jacob Bernoulli's proof of the "law of large numbers," which "enabled [man] at least to ascertain *a posteriori* what we cannot determine *a priori*, that is, to ascertain it from the results observed in numerous similar instances." Jacob Bernoulli, *The Law of Large Numbers*, in *WORLD OF MATHEMATICS VOLUME 3*, *supra* note 20, at 1452, 1453. Bernoulli's theory assumed that "the occurrence (or nonoccurrence) of an event in the future will follow the same pattern as was observed for like events in the past." *Id.* Abraham de Moivre demonstrated how a set of random samples would distribute themselves around an average value, thereby transforming Bernoulli's assumption into a foundational premise of modern statistics. BERNSTEIN, *supra* note 11, at 127-28. Samples, whether from past data or from some other larger population, could be used to represent the true universe of possibilities. See *id.* at 126 (describing the use of a small sample to generalize about life expectancies). De Moivre trumpeted the confidence of this nascent statistical science: "'altho' Chance produces irregularities, still the Odds will be infinitely great, that in process of Time, those Irregularities will bear no proportion to the recurrency of that Order which naturally results . . .'" ANDERS HALD, *A HISTORY OF PROBABILITY AND STATISTICS AND THEIR APPLICATIONS BEFORE 1750 490-91* (2003) (quoting de Moivre from 1738).

22. BERNSTEIN, *supra* note 11, at 133.

23. See, e.g., Henri Poincaré, *THE FOUNDATIONS OF SCIENCE*, in 1 *SCIENCE AND EDUCATION: A SERIES OF VOLUMES FOR THE PROMOTION OF SCIENTIFIC RESEARCH AND EDUCATION PROGRESS 395* (J. McKeen Cattell ed., 1921) (discussing probability at the turn of the twentieth century).

regulation, as well as its formalization and systemization within corporate and other organizational networks of authority and information. In both government and in industry, “risk management has become more important than ever before.”²⁴ One commentator has gone so far as to call risk management a “new religion.”²⁵ Another refers to the “explosion” of risk management.²⁶ Still others describe risk management as a “key business competence”²⁷ or “the new strategic imperative in financial management.”²⁸

The proliferation of risk management norms and regulation in recent decades can be explained according to two alternative stories. According to one story, referred to here as *the traditional story of risk management*, risk management and risk management regulation are seen as functional, practical responses to the challenge of managing in an increasingly volatile operating environment.²⁹ The other story, referred to here as the *alternative story of risk management*, is more skeptical and, though it acknowledges the empirical fact of risk management as an enhanced organizational priority, it interrogates risk management’s normative assumptions. When considering these contrasting stories, important points of divergence emerge. Whether one looks optimistically to risk management and its regulation as a managerial practice will depend on which story one finds more convincing. The traditional story portrays risk management as a tractable set of practices that generate information from the political-rhetorical and descriptive-relational dimensions of risk and apply that information to promote organizational objectives. The alternative story, by contrast, exposes problematic assumptions with the implementation of risk management into corporate governance infrastructure.

II. THE TRADITIONAL STORY: RISK MANAGEMENT REGULATION AS TOOL FOR MANAGING ORGANIZATIONAL UNCERTAINTY

Among bankers and regulators, a dominant narrative describes banks entering a new, riskier operating environment starting in the 1980s. In response, bank regulators pursued their statutory missions—promoting the safety and soundness of individual institutions and system-wide financial

24. James Lam, *Managing Risk Across the Enterprise: Challenges and Benefits*, in RISK MANAGEMENT: A MODERN PERSPECTIVE 3, 3 (Michael K. Ong ed., 2006).

25. Bernstein, *supra* note 1, at 47.

26. MICHAEL POWER, THE RISK MANAGEMENT OF EVERYTHING 9 (2004), available at <http://www.demos.co.uk/files/riskmanagementofeverything.pdf>.

27. SATYAJIT DAS, RISK MANAGEMENT 4 (3d ed. 2006) (emphasis omitted).

28. JAMES T. GLEASON, RISK: THE NEW MANAGEMENT IMPERATIVE IN FINANCE xvii (2000).

29. See, e.g., POWER, *supra* note 26, at 37-38 (describing the new risk management approach as a “rational response” to today’s “more risky” environment).

stability—by harnessing advances in risk management systems being developed by the banks themselves. According to this account, regulators intervened intermittently into corporate governance by imposing new risk management responsibilities on banks, often highlighting the best practices of forward-thinking institutions. As market structures and activities evolved and new manifestations of risk materialized—including most prominently with respect to interest rate risk, market risk, credit risk, and operational risk—regulators responded by requiring banks to update their risk management systems to control the threats posed by such risks. This traditional story depicts a logic of control characterized by a dynamic game of threat identification and response. This story can be traced throughout the 1980s into the 2000s in the bank regulatory actions discussed below.

The increasing emphasis by regulators on shaping internal risk management norms recalls what Cary Coglianese and David Lazer label *management-based regulation* (MBR). MBR describes the process by which public administrators direct regulated organizations to engage in a planning process that aims to achieve public goals, while offering industry flexibility concerning the operational details for the achievement of those goals.³⁰ The authors argue that MBR is appropriate where regulated entities are heterogeneous and regulatory outputs are difficult to monitor.³¹ Regulated institutions with heterogeneous circumstances are not appropriate candidates for what the authors call “technology-based”³² regulatory approaches; such approaches specify techniques, procedures, restrictions to be used in regulation, and are commonly referred to as command-and-control regulations.³³ The use of rigid “[t]op-down, control-oriented logic is ill-suited to the dynamism of risk in a knowledge society, which resists containment and instead demands active management.”³⁴ Conversely, where critical external outputs are difficult to monitor, “performance-based” regulatory regimes designed to intervene at the output stage (the classic example being pollution taxes set at the optimal amount required to offset the incentive to pollute³⁵) are unlikely to result in

30. See Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 LAW & POL’Y 691, 693-96 (2003) (describing the goals of MBR, as well as its criteria, advantages, and implementation).

31. *Id.*

32. *Id.* at 701.

33. Jodi L. Short, *The Paranoid Style in Regulatory Reform*, 63 HASTINGS L.J. 633, 656-63 (2012).

34. Susan V. Scott & Geoff Walsham, *Reconceptualizing and Managing Reputation Risk in the Knowledge Economy: Toward Reputable Action*, 16 ORG. SCI. 308, 310 (2005).

35. See Martin Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUDIES 477, 477 (1974) (discussing the debate between controlling pollution through emissions standards or taxes).

efficient administration.³⁶

Exploration with MBR approaches in the banking sector is hardly surprising. With its institution-specific, idiosyncratic, and hard-to-monitor risk profiles, the banking industry is a natural candidate for regulation. By influencing the way in which risk is conceived, deliberated, and acted on within a bank, regulators could preserve context-specificity and simultaneously elude the thorny epistemic problem of how to monitor excessive risk on an ongoing basis. Regulators adopting an MBR approach would intervene at the planning stage, helping and overseeing the regulated institution as it deliberates on how to promote regulatory objectives.³⁷

Whether regulators have had success in their MBR approaches is discussed below, but the Coglianesse-Lazer model provides a useful lens through which to consider risk management as a subject of bank regulation. Other regulatory scholars have developed similar notions, such as “meta risk management,”³⁸ “meta-monitoring,”³⁹ “meta-regulation,”⁴⁰ “directly deliberative polyarchy,”⁴¹ and “responsive regulation.”⁴² These models of regulation aim to reorient regulatory practice in light of the limits of state power to regulate in decentralized, dynamic, volatile, and at times even authentically complex,⁴³ realms of human activity. They are characterized, somewhat counter-intuitively, both by the devolution of discretion to industry and enhanced pretensions of control. Regulation works on the systems and procedures through which corporate authority results in corporate activity. Regulators use public power to “push control further into organizational structures, inscribing it within systems which can then

36. Coglianesse & Lazer, *supra* note 30, at 701-02.

37. *Id.* at 694, 706.

38. John Braithwaite, *Meta Risk Management and Responsive Regulation for Tax System Integrity*, 25 LAW & POL’Y 1, 1 (2003) (“Meta risk management is a promising strategy when risks are volatile and difficult for the regulator to comprehend when the risks are effectively under the control of an organization over which the regulator has leverage.”).

39. Peter N. Grabosky, *Using Non-Governmental Resources to Foster Regulatory Compliance*, 8 GOVERNANCE: AN INT’L J. OF POL’Y & ADMIN. 527, 543 (1995).

40. CHRISTINE PARKER, *THE OPEN CORPORATION: SELF-REGULATION AND DEMOCRACY* 15 (2002).

41. Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267, 288 (1998) (emphasis omitted).

42. See IAN AYRES & JOHN BRAITHWAITE, *RESPONSIVE REGULATION* 1 (1992) (introducing responsive regulation and distinguishing it from other regulation strategies “both in what triggers a regulatory response and what the regulatory response will be”); see also Robert Baldwin & Julia Black, *Really Responsive Regulation*, 71 MOD. L. REV. 59, 69 (2008) (advocating a responsive regulation that responds “not merely to firms’ compliance responses but also to their *attitudinal settings*[.] to the *broader institutional environment* of the regulatory regime”).

43. On the complexity of contemporary financial markets, see Robert F. Weber, *Structural Regulation as Antidote to Complexity Capture*, 47 AM. BUS. L.J. 643 (2012).

be audited.”⁴⁴ The traditional story relies on these models of regulation and their sequential logic of threat perception and flexible regulatory response.

A. The Risk Management Revolution and the Derivatives Revolution

The traditional story must begin, for both conceptual and historical reasons, with an overview of the derivatives revolution that commenced in the 1980s.⁴⁵ A derivative is a financial contract whose value depends on the values of one or more underlying assets, indexes, or reference rates.⁴⁶ Although some derivatives can be extremely complicated, all of them can be divided into two broad categories: options and forward contracts.⁴⁷ Derivatives are either standardized contracts executed on exchanges (i.e., “exchange-traded”) or custom-tailored, negotiated transactions (i.e., over-the-counter, or “OTC”).⁴⁸

Though many factors are responsible for fueling the derivatives boom, one principal motivating force was the need to hedge against an increasingly risky business environment.⁴⁹ The collapse of the Bretton Woods system of managed exchange rates in the early 1970s augured a secular shift in the risk profile of the banking business. This, along with other threats to financial markets during the 1960s and 1970s, led banks to hedge against these risks by creating a “new breed of securities,” including currency futures and options and interest rate swaps.⁵⁰

44. POWER, *supra* note 17, at 42.

45. The opening paragraph of the introduction to a text on financial risk management illustrates the centrality of derivatives: “The development of derivative instruments has emerged as perhaps the most significant aspect of capital markets in the last 20 years. Exchange-traded and over-the-counter derivatives have radically altered the practice of borrowing, investment and risk management.” DAS, *supra* note 27, at ix. Moreover, the author notes, “[t]he increased emphasis on risk management has seen a parallel process of establishing a series of practice benchmarks. The central driver was the growth in derivatives activity.” *Id.* at 12.

46. GROUP OF THIRTY, DERIVATIVES: PRACTICES AND PRINCIPLES 26 (1993) [hereinafter PRACTICES AND PRINCIPLES].

47. *Id.* at 27; BASEL COMMITTEE ON BANKING SUPERVISION, RISK MANAGEMENT GUIDELINES FOR DERIVATIVES 2 (1994), available at <http://www.bis.org/publ/bcbcs211.pdf> [hereinafter BASEL RISK MANAGEMENT GUIDELINES].

48. PRACTICES AND PRINCIPLES, *supra* note 46.

49. Other uses of derivatives unrelated to risk reduction include lowering funding costs, diversifying funding sources, and enhancing returns by exploiting arbitrage opportunities. *Id.* at 26, 32-40.

50. MICHEL CROUHY ET AL., RISK MANAGEMENT xix (2001); see also RAFFAELE SCALCIONE, THE DERIVATIVES REVOLUTION 18 (2010) (recommending four steps to strengthen the regulation of over-the-counter derivatives); GLEASON, *supra* note 28, at 28 (discussing tools and techniques used to measure and manage hedging risks). Other accounts trace the genesis of modern currency and interest rate swaps to back-to-back loan transactions, which were popularized in the 1970s for avoiding capital controls rather than

Furthermore, the deregulatory climate of the 1970s and 1980s opened up inter-sectoral competition among banks, securities firms, insurance companies, and mutual funds. The Federal Reserve Bank (FRB), which has supervisory responsibility over bank holding companies, permitted banks to establish affiliates to underwrite and deal in securities otherwise off-limits to the banks themselves, including equities and bonds. As a result of these activities, banks became subject to heightened market risk—that is, the risk that the market price of an asset or liability may change over a given time period because of economic changes or other events.⁵¹ Starting in the mid-1980s, the Office of the Comptroller of the Currency (OCC), the lead regulator of the largest U.S. banks, gradually and deliberately empowered banks to become dealers in OTC derivatives.⁵² Though the expansive definition of “commodity” in the Commodity Exchange Act (CEA) could be read to subject many OTC derivatives to federal regulation, Congress and the Commodity Futures Trading Commission (CFTC) accepted the banks’ position that privately-negotiated OTC derivatives should be unregulated.⁵³ The market expanded from

hedging and risk management purposes. JOHN F. MARSHALL & KENNETH R. KAPNER, UNDERSTANDING SWAPS 2-5 (1993). Such discussions acknowledge, however, that whatever the precedent model transactions that gave rise to early swaps, the foreign exchange and interest rate volatility of the 1980s caused the market to grow rapidly. *Id.* at 6.

51. Jorge R. Sobehart & Sean C. Keenan, *New Challenges in Credit Risk Modeling and Measurement*, in RISK MANAGEMENT: A MODERN PERSPECTIVE, *supra* note 24, at 203, 208.

52. Saule T. Omarova, *The Quiet Metamorphosis: How Derivatives Changed the “Business of Banking”*, 63 U. MIAMI L. REV. 1041 (2009).

53. See *Trading in Foreign Currencies for Future Delivery*, 50 Fed. Reg. 42,983, 42,985 (Oct. 23, 1985) (discussing the various types of instruments that will remain unregulated); *Policy Statement Concerning Swap Transactions*, 54 Fed. Reg. 30,694 (Jul. 1, 1989) (providing a safe harbor from CFTC regulation for OTC swap transactions meeting specified requirements). Banks were unsatisfied by the CFTC’s 1989 policy statement, perceiving in it a latent legal risk that the CFTC could later withhold the safe harbor, and therefore lobbied in favor of a comprehensive statutory exemption. The banks’ confusion stemmed from the seeming incongruence between the 1989 policy statement and the so-called Treasury Amendment to the Commodity Futures Trading Commission Act of 1974, which exempted OTC “trading in foreign currency,” among other transactions, from the CEA altogether. 50 Fed. Reg. 42,985; *see also* U.S. GEN. ACCOUNTING OFFICE, COMMODITY EXCHANGE ACT: ISSUES RELATED TO THE REGULATION OF ELECTRONIC TRADING SYSTEMS 8 (2000), available at <http://www.gao.gov/assets/230/229069.pdf> (noting that the Treasury Amendment operated on the assumption that bank regulators, rather than the SEC or CFTC, would supervise OTC derivatives markets); GORDON F. PEERY, THE POST-REFORM GUIDE TO DERIVATIVES AND FUTURES 272 (2012) (noting the conflicting interpretations). The Treasury Amendment was proposed by the U.S. Department of the Treasury in recognition of the prevalence of financially knowledgeable institutional investors in the foreign exchange futures markets. See *Trading in Foreign Currencies for Future Delivery*, 50 Fed. Reg. at 42,983-85 (Oct. 23, 1985) (CFTC) (distinguishing sales to the general public from those made to institutional investors). In October 1992, Congress provided the CFTC with

“vanilla” interest rate and currency swaps to “derivatives linked to credit risk, currency convertibility risk, equity risk, macro-economic indicia (including inflation and unemployment rates), market access risk, and volatility and weather risk, as well as derivatives replicating both real estate investments and the dynamic portfolios of securities and derivatives.”⁵⁴ A wave of consolidation in the banking industry, coupled with the increased diversification into other business lines, created financial institutions that were larger in asset size and wider in scope than ever before. With size came new operational risks, as business units became subject to risk of automated systems failures and human errors or frauds across a wider array of affiliated businesses.⁵⁵

But the derivatives revolution carried with it a paradox: the increases in the number and trading volume of new derivatives instruments remedied existing risks while they created new ones. This paradox is best understood by comparing the view of derivatives from a portfolio-specific perspective to an institution-wide perspective. Banks and other businesses found themselves facing new manifestations of credit, market, interest rate, liquidity, and operational risks. Derivatives allowed them to hedge their exposures.⁵⁶ Derivatives are, like insurance, inherently capable of functioning as risk reduction instruments; they are contracts between a party that is paid to assume certain risks and a counterparty that buys protection against that risk.⁵⁷ A summary of risk management in *The Oxford Handbook of Banking* defines risk management as the discipline of offsetting exposures through the use of derivatives.⁵⁸ Such a definition is

authority to exempt certain classes of OTC derivatives from regulation under the CEA. Futures Trading Practices Act, Pub. L. 102-546, 106 Stat. 3590 (1992) (repealed 2000). The Act also invoked federal preemption to exempt most OTC derivative transactions from the scope of state anti-gambling laws, which facially seemed to prohibit such transactions. Kenneth C. Kettering, *Securitization and Its Discontents: The Dynamics of Financial Product Development*, 29 CARDOZO L. REV. 1553, 1654-55 (2008). Three months later, the CFTC exempted OTC swaps from the CEA. Exemption of Certain Swap Agreements, 58 Fed. Reg. 5587 (Jan. 22, 1993) (codified at 17 C.F.R. § 230.240 (2012)).

54. Paul Ali, *Corporate Governance and Derivatives End Users*, in PRACTICAL DERIVATIVES 9, 9 (Carolyn Boyle et al. eds., 2d ed., 2010).

55. The Basel Committee on Banking Supervision has provided a very general but influential definition of operational risk as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.” BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS 144 (2006), available at <http://www.bis.org/publ/bcbs128.htm> [hereinafter BASEL II FRAMEWORK].

56. See Linda Allen & Anthony Saunders, *Risk Management in Banking*, in THE OXFORD HANDBOOK OF BANKING 99 (Allen N. Berger et al. eds., 2010) (describing derivative markets as “the thermostat used by the bank to control its risk temperature”).

57. See PEERY, *supra* note 53, at 3 (comparing derivatives to insurance contracts).

58. Allen & Saunders, *supra* note 56, at 90.

too narrow, but it underscores the centrality of derivatives to any account of the heightened concern for risk management. From a portfolio-specific perspective, then, a derivative transforms a given risk exposure for the portfolio into a credit risk exposure against the derivative counterparty. Where that credit exposure is less risky than the risk against that which the derivative protects—which is nearly always the case—the derivative reduces the total amount of risk faced by the exposed entity.⁵⁹

Unlike insurance purchasers, however, which are only empowered to obtain insurance against exposures in which they possess an insurable interest, an OTC derivatives trader is unrestrained as a contractual matter in the amount of exposure it can create.⁶⁰ The derivatives trader's only constraints are the ingenuity of parties drafting derivatives contracts and the continued willingness of counterparties to accept the terms of the contract. Thus, there is theoretically no limit to the amounts of exposure a bank can create, either entrepreneurially or unwittingly.⁶¹

In the early years of OTC derivatives, banks acted as brokers between two counterparties desiring to take opposite sides of a trade.⁶² But banks gradually began acting as parties in the transactions, developing their own portfolios of derivatives. The accumulation of proprietary positions in derivatives required dealer banks to confront a new challenge: how to manage the net risk of its overall position. As a result of the transition from brokering transactions to maintaining portfolios, trade volume skyrocketed and the dimensionality of institution-specific risk increased by orders of magnitude.⁶³ Regulators such as Alan Greenspan, then Chairman

59. For this statement to be true in all circumstances, we would also need to verify that the bank was not, by accepting a credit exposure, incurring other unforeseen exposures. See JOHN C. HULL, *RISK MANAGEMENT AND FINANCIAL INSTITUTIONS* 55-76 (2007) (describing how traders hedge risk exposures with derivatives).

60. Absent an insurable interest on the part of the insured, an insurance contract is void as a wagering contract. See LEE R. RUSS & THOMAS F. SEGALLA, 3 *COUCH ON INSURANCE* § 41:1 (3d ed. 2009) (defining insurable interest). Conversely, a derivatives dealer, unencumbered by the insurable interest requirement, faces no limits, at least as a matter of contract and insurance law, in its ability to wager.

61. In the case of an option contract, which is a basic type of derivative, the writer of a *single* option is exposed to the possibility of (a theoretic) unlimited loss if its exposure remains un-hedged. See BASEL COMM. BANKING SUPERVISION, *THE MANAGEMENT OF BANKS' OFF-BALANCE SHEET EXPOSURES* 5 (1986), available at <http://www.bis.org/publ/bcbasc134.pdf> [hereinafter *MANAGEMENT OF OFF-BALANCE SHEET EXPOSURES*].

62. See *PRACTICES AND PRINCIPLES*, *supra* note 46, at 39-40 (discussing the financial goals motivating trades for each party). For example, Party A might want to hedge against fuel price inflation and Party B might want to speculate that fuel prices will decrease. Party A and Party B would then contact Bank, a known derivatives dealer, who would match Party A and Party B and document the trade for a fee.

63. By 1996, derivatives had evolved from obscure risk management devices to

of the Board of Governors of the Federal Reserve System, viewed the expansion in trading volumes of derivatives with equanimity, convinced that banks were incurring new exposures precisely *because of* an enhanced ability to manage risk.⁶⁴

Other regulators were less confident. While the Basel Committee recognized that the “basic risks associated with derivatives transactions are not new to banking organizations[,]”⁶⁵ it remained mindful that the basic risks could be “repackage[d] . . . in combinations that can be quite complex,” in the process “threaten[ing] the safety and soundness of institutions if they are not clearly understood and properly managed.”⁶⁶ By the mid-1990s, however, regulators began to recognize problems deeper than the institution-specific safety and soundness concerns. In particular, the failure of a single large derivatives dealer could “cause liquidity problems in the markets and could also pose risks to others, including federally insured banks and the financial system as a whole.”⁶⁷ In the words of a Bank for International Settlements official in 1995, the vulnerability of banks had increased markedly, requiring regulators “to anticipate new sources of change,” while at the same time recognizing that they “will not always be successful.”⁶⁸

During the 1980s and 1990s, U.S. lawmakers, courts, and regulators sought to preserve the productive advantages of the new generation of derivative instruments and other financial innovations, while at the same time indirectly encouraging the use of risk management techniques among financial institutions dealing in derivatives markets. The new risk

comprise a market twice the size of the U.S. stock market and more than ten times the total U.S. sovereign debt. FRANK PARTNOY, F.I.A.S.C.O. STREET 15 (1997).

64. See *Testimony by Alan Greenspan, Chairman, Bd. of Governors of the Fed. Reserve Sys. Before the Subcomm. on Telecomm. & Fin. of the U.S. H. Comm. on Energy & Commerce*, 103d Cong. 26 (1994) (statement of Alan Greenspan, Chairman, Board of the Governors of the Federal Reserve System), available at <http://fraser.stlouisfed.org/historicaldocs/805/download/27981/Greenspan-19940525.pdf> (“It is important to recognize that significant advances in the management of market and credit risks, including improvements both in financial methodology and in the design of management information systems, lie behind the recent surge in derivatives activity.”).

65. BASEL RISK MANAGEMENT GUIDELINES, *supra* note 47, at 3. See PRACTICES AND PRINCIPLES, *supra* note 46, at 2 (“Derivatives help to manage risk in new ways—an important economic function. Yet the risks involved in derivatives activities are neither new nor unique. They are the same kinds of risks found in traditional financial products: market, credit, legal, and operational risks.”).

66. BASEL RISK MANAGEMENT GUIDELINES, *supra* note 47, at 3.

67. U.S. GEN. ACCOUNTING OFFICE, FINANCIAL DERIVATIVES: ACTIONS NEEDED TO PROTECT THE FINANCIAL SYSTEM 7 (1994), available at <http://www.gao.gov/assets/160/154342.pdf> [hereinafter GAO DERIVATIVES REPORT].

68. Andrew Crockett, *Speech Before the Swiss Bankers Association*, Sept. 27, 1995 in DMITRIS CHORAFAS, RISK MANAGEMENT TECHNOLOGY IN FINANCIAL SERVICES 9 (2007).

environment changed the nature of the banking business and regulation. As described by FRB Governor Dan Tarullo:

Gone were the days when a bank CEO had a hands-on sense of the risks entailed in even a large bank's significant operations—mortgage, consumer, corporate, etc. With the growth in off-balance-sheet activities [such as derivatives], the explosion of creative securitization and other financial innovations, and the erosion of barriers between commercial banking and other financial activities, even the most diligent senior management was inevitably unaware of the nature and scope of at least some significant risks.⁶⁹

This “inevitable unawareness” of bank management—along with the concomitant recognition that regulators were even further removed from meaningful risk awareness—motivated regulators to think creatively about facilitating solutions to the challenge of managing uncertainty.

Crucially, however, regulators stopped short of expressly prescribing the content that risk management obligations entail, instead preferring that the industry develop its own risk management practices and infrastructure. This phenomenon is not limited to finance. Public law authorities have made broad-based risk management interventions into the corporate governance of non-financial firms as well. These efforts in the non-financial context have consisted predominantly of requiring firms to monitor internal controls over financial reporting and legal compliance—a *narrow, compliance-oriented risk management*. These internal control measures constitute a subset of risk management relating to legal and accounting risks that form part of the broader constellation of risk management tools.⁷⁰ In recognition of the potential risks of instability inherent in derivatives markets, legislative and regulatory initiatives in the financial arena have gone beyond compliance-oriented risk management to foster a *broad, comprehensive risk management*, through the use of express directives to constitute—and over time, reinforce—a risk management function within the firm that is responsible for assessing all risks.

B. Origins of Risk-Management as Compliance-Oriented Internal Control

This article focuses on risk management systems at financial institutions. Though the derivatives discussion above highlights why risk

69. DANIEL K. TARULLO, BANKING ON BASEL: THE FUTURE OF INTERNATIONAL FINANCIAL REGULATION 175 (2008).

70. See OECD CORPORATE GOVERNANCE REPORT, *supra* note 3, at 6 (warning that internal controls are insufficient to cover the entire range of enterprise risk management).

management became a new managerial imperative in the finance industry in the 1980s and 1990s, risk management attracted the attention of lawmakers, courts, and regulators in other contexts as well. During the same period, public law authorities perceived that the task of managing large-scale, often multinational, enterprises required new organizational responses to risks.⁷¹ These authorities responded by intervening into corporate governance, usually by addressing the adequacy of internal controls over financial reporting and legal compliance rather than risk itself. Internal controls are those processes designed to ensure that an organization has in place an organizational behavior corresponding to a particular risk and a control to ensure that the behavior is both being applied and working as intended.⁷² A system of internal controls, if designed effectively, can provide reasonable assurance that an organization performs reliably, in accordance with its policies, and in pursuit of its objectives.⁷³ The concept of compliance—i.e., with laws, with accounting rules, or more broadly, with firm-wide organizational policies or objectives—is at the heart of internal control systems.⁷⁴ In recognition of the heterogeneity of organizational settings, these legal authorities have generally left the operationalization and elaboration of internal controls to industry itself, stopping short of expressly prescribing any particular format. As applied to banks, these legal responses operated as a sort of background, default mandatory regime governing the monitoring and control of a class of uncertain events, and also as a comparison point for the more expansive systems of risk control, to be discussed later in Sub-Parts II.C and II.D, that regulators imposed on banks.

Judicial intervention in this area has taken the form of an expansive gloss on the common law fiduciary duties of care and loyalty.⁷⁵ A basic

71. See Betty Simkins & Steven A. Ramirez, *Enterprise-Wide Risk Management and Corporate Governance*, 39 LOY. U. CHI. L.J. 571, 571 (2008) (highlighting some of the risks faced by large multinational enterprises).

72. BASEL COMM. ON BANKING SUPERVISION, PRINCIPLES FOR ENHANCING CORPORATE GOVERNANCE 17 (2010), available at <http://www.bis.org/publ/bcbs176.pdf>.

73. See, e.g., Commission Guidance Regarding Management's Report on Internal Control Over Financial Reporting Under Section 13(a) or 15(d) of the Securities Exchange Act of 1934, 72 Fed. Reg. 35,324, 35,336 (Jun. 27, 2007) (discussing internal controls); see also BASEL COMM. ON BANKING SUPERVISION, FRAMEWORK FOR INTERNAL CONTROL SYSTEMS IN BANKING ORGANIZATIONS 1 (1998), available at <http://www.bis.org/publ/bcbs40.pdf> (emphasizing the importance of internal controls for a bank).

74. See generally Kimberly D. Krawiec, *Cosmetic Compliance and the Failure of Negotiated Governance*, 81 WASH. U. L. R. 487 (2003) (summarizing and skeptically assessing the legal treatment of the compliance function).

75. Whether the failure-to-monitor claim alleges a breach of the duty of loyalty or the duty of care does not impact the application of the business judgment rule, though if the

precept of corporate law is that a board of directors has the primary responsibility for overseeing the business and affairs of a corporation.⁷⁶ In exercising this responsibility, the board is subject to a duty of loyalty and a duty of care.⁷⁷ During the past two decades, courts, perhaps due in part to the increasing complexity of firm-specific risk profiles, have interpreted these duties to include a responsibility to ensure that a firm has adequate monitoring and reporting systems, though they have stopped short of expressly requiring any particular form of risk management system. For example, the Delaware Chancery Court famously stated in *In re Caremark International Derivative Litigation* that a corporate board of directors' duties include ensuring that an adequate "corporate information and reporting system" is in place to provide management with "timely, accurate information."⁷⁸ Ten years later, the Delaware Supreme Court recognized in *Stone v. Ritter* the validity of a *Caremark* failure-to-monitor claim, but limited the scope of the claim to instances where the board demonstrates a "conscious disregard" for its duty to provide for a corporate information infrastructure.⁷⁹ Only where a board of directors "utterly fail[s] to implement *any* reporting or information system or controls" will a violation of the duty of care be found.⁸⁰ Both *Caremark* and *Stone* focused on the critical role that information flow plays in reducing the risk of unlawful activity—a risk for which minimal, if not zero, tolerance is given.⁸¹

claim is framed as a breach of the former duty, the defendant directors will not be able to avail themselves of a section 102(b)(7) exculpatory clause. See Stephen M. Bainbridge, *Caremark and Enterprise Risk Management*, 34 IOWA J. CORP. L. 967, 975 (2009) (discussing the care executives must take in their duties to monitor).

76. See, e.g., Del. Code Ann. tit. 8, § 141(a) (West 2009) ("The business and affairs of every corporation organized under this chapter shall be managed by or under the direction of a board of directors, except as may be otherwise provided in this chapter or in its certificate of incorporation.").

77. See *Stone v. Ritter*, 911 A.2d 362, 369-70 (Del. 2006) (discussing the doctrinal boundaries of the board's duties of loyalty and care).

78. *In re Caremark Int'l Inc. Derivative Litg.*, 698 A.2d 959, 970 (Del. Ch. 1996). *Caremark* was before the Chancery Court for judicial approval of a settlement agreed to by the parties, so the portions of Chancellor Allen's opinion concerning the duty to monitor are technically dicta. Nevertheless, the duty-to-monitor analysis has "morphed into what has come to be known as a *Caremark* claim" in both federal and state courts both within and outside of Delaware. Paul E. McGreal, *Corporate Compliance Survey*, 64 BUS. LAW. 253, 272 (2008).

79. *Stone*, 911 A.2d at 369-70. In *Caremark*, Chancellor Allen warned that a failure-to-monitor claim was "possibly the most difficult theory in corporation law upon which a plaintiff might hope to win a judgment." *Caremark*, 698 A.2d at 967. In *Stone*, the Supreme Court quoted his observation approvingly. *Stone*, 911 A.2d at 372.

80. *Stone*, 911 A.2d at 370 (emphasis added).

81. Although risk management and legal compliance (including internal controls over financial reporting) are not different in kind, they are different in degree, inasmuch as boards are expected to establish some tolerance for risk taking (unlike law-breaking). See

In 2008, plaintiffs brought a novel failure-to-monitor claim against Citigroup Inc., alleging that the board of directors failed to monitor and oversee risks associated with the housing market in the lead up to the most recent financial crisis.⁸² Plaintiffs did not, however, allege breaches of the law or financial statement inaccuracies.⁸³ In this case, the Delaware Chancery Court refused to allow a *Caremark* claim against Citigroup directors to proceed.⁸⁴ The Court observed that plaintiffs' claims differed from traditional *Caremark* claims in that plaintiffs allegedly "fail[ed] to properly monitor Citigroup's *business risk*, specifically its exposure to the subprime mortgage market."⁸⁵ The court emphasized the relevance of the business judgment rule—i.e., that good faith business decisions are not challengeable in court unless plaintiffs can prove a violation of the board's duties of care and loyalty—even in the context of a *Caremark*-style failure-to-monitor claim. In the end, the plaintiffs did not plead with adequate specificity how the oversight mechanisms instated by the board to monitor business risk were inadequate.⁸⁶ Plaintiffs' case was no doubt handicapped by their acknowledgement that Citigroup had created an audit and risk management committee of the board that met twenty-three times through 2006 and 2007.⁸⁷ Notably, however, the Chancery Court clarified that oversight responsibilities described in *Caremark* were not limited to internal control over financial reporting and legal compliance, stating that "it may be possible for a plaintiff to meet the [*Caremark*] burden under some [different] set of facts" in a suit alleging failure to monitor business risk.⁸⁸ Though *Citigroup* applies some pressure on boards to oversee the implementation of risk management systems, the Delaware Supreme Court's imposition of the "conscious disregard" requirement in *Stone* seems to afford a board wide discretion.

Congress and regulators also focused on internal controls during this period in the banking industry and elsewhere. Such efforts adopt a management-based regulatory model under which the abstract systems of internal control over risks, rather than the risk outputs themselves, became the regulated subject.⁸⁹ Though the external audit as a mode of assurance

Bainbridge, *supra* note 76, at 982-84.

82. *In re Citigroup Inc. S'holder Derivative Litig.*, 964 A.2d 106 (Del. Ch. 2009).

83. *Id.*

84. *Id.* at 112.

85. *Id.* at 123.

86. *Id.* at 128.

87. *Id.* at 127.

88. *Id.* at 126.

89. See *supra* notes 30-37 and accompanying text (explaining the features of management-based regulation).

provision had been around for centuries,⁹⁰ a heightened emphasis on internal control represented a new control logic that focused on the system rather than the reliability of individual acts.⁹¹ Internal controls assumed increasing importance in the accounting profession as businesses became more complicated, particularly with international expansion.⁹² Businesses with strong internal controls over accounting would require a lower degree of external verification for their accounts.

The first public law foray into internal control dates to the mid-1970s when Congress, responding to a series of corporate bribery scandals, enacted the Foreign Corrupt Practices Act (FCPA).⁹³ The FCPA aimed to redress a new perceived threat: bribery and corruption by U.S. firms with global operations. Recognizing that Congress lacked the expertise to prescribe standards for how to organize control over firm assets and that U.S. regulators lacked the enforcement resources to police business units in far-flung corners of a globalized economy, the FCPA requires firms, among other things, to have in place “a system of internal accounting controls sufficient to provide reasonable assurances” that access to and use of corporate assets occur only with proper authorization and that transactions are properly recorded.⁹⁴

Congress took the internal controls mandate a step further in the banking context by requiring specific attestations from management. Following the savings and loan debacle of the late 1980s, Congress enacted a sweeping reform of federal banking regulation with the Federal Deposit

90. See, e.g., DEREK MATTHEWS, *A HISTORY OF AUDITING: THE CHANGING AUDIT PROCESS IN BRITAIN FROM THE NINETEENTH CENTURY TO THE PRESENT DAY* 6 (2006) (recounting how landlords in Medieval Europe employed auditors to provide anti-fraud assurance with respect to stewards' accounts).

91. See POWER, *supra* note 17, at 20 (describing a shift to internal control testing by auditing practitioners in the 1930s); *cf. id.* at 88 (“Audits become possible in complex environments by abstracting from that complexity and by operating upon a systems surface which in some cases has been designed with auditability in mind.”).

92. Michael Power ascribes the preference for internal control over direct audit in terms of cost reduction. See *id.* at 82 (“Even though economic pressures may have driven auditors to reduce the volume of their transactions work, the idea of reliance on auditee controls is fundamentally plausible: if one can have confidence that a system exists to control the completeness, accuracy and validity of transactions between an organization and its environment, then it is unnecessary to duplicate this work and look at the transactions in detail.”).

93. See JAMES D. COX ET AL., *SECURITIES REGULATION* 558-59 (6th ed. 2009) (discussing the scandals that preceded the FCPA's enactment).

94. 15 U.S.C. § 78m(b)(2) (2006). The FCPA also prohibited the making of most payments to foreign officials and their representatives for purposes of making or retaining business. *Id.* § 78dd-1(a). As such, the FCPA employs a hybrid regulatory approach utilizing MBR and PBR. See *supra* notes 30-37 and accompanying text for a discussion of those approaches.

Insurance Corporation Improvement Act of 1991 (FDICIA). Among other things, FDICIA required a bank's CEO and chief accounting or financial officer to sign statements acknowledging their responsibility for "establishing and maintaining an adequate internal control structure" and maintaining compliance with regulations regarding the safety and soundness of their banks.⁹⁵ The same executives also were required to attest to the effectiveness of the internal control environment.⁹⁶ FDICIA also required federal bank regulators to establish certain safety and soundness standards for FDIC-insured banks, including with respect to internal controls and information systems.⁹⁷ These standards would be evaluated during bank examinations.

Shortly thereafter, the Committee of Sponsoring Organizations of the Treadway Commission (COSO),⁹⁸ a consortium of the major accounting professional associations, published the first comprehensive guide to the internal control function.⁹⁹ The non-binding COSO internal controls framework defined internal control as a "process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement" of certain specified types of organizational objectives.¹⁰⁰ Importantly, the framework identified not only the traditional internal control objects—i.e., compliance with law and financial reporting reliability—but also "effectiveness and efficiency of operations."¹⁰¹ According to the COSO framework, a system of internal controls could be designed to promote any of an entity's business objectives, "including performance and profitability goals and safeguarding of resources."¹⁰² This marks a point of departure in the internal control literature and recalls the political-rhetorical dimension of risk.¹⁰³ COSO addressed the descriptive-relational dimension of risk as well, including risk assessment and ongoing risk monitoring as two of the five pillars of a

95. Federal Deposit Insurance Corporation Improvement Act of 1991, § 36(b), Pub. L. 102-242, 105 Stat. 2242 (1991) (codified at 12 U.S.C. § 1831m(b)).

96. *Id.*

97. *Id.* § 39 (codified at 12 U.S.C. § 1831p-1).

98. The organizational name for the Treadway Commission was the National Commission on Fraudulent Financial Reporting. Founded in 1985 by COSO, it took its name from James C. Treadway, Jr., its initial chairman and former commissioner of the U.S. Securities and Exchange Commission.

99. COMM. OF SPONSORING ORGS. OF THE TREADWAY COMM'N, INTERNAL CONTROL—INTEGRATED FRAMEWORK (1992), available at <http://www.coso.org/ic-integratedframework-summary.htm> [hereinafter COSO INTERNAL CONTROLS FRAMEWORK].

100. *Id.*

101. *Id.*

102. *Id.*

103. See *supra* note 13 and accompanying text for a discussion of that dimension.

system of internal control.¹⁰⁴ With the COSO framework, the internal controls discourse had evolved into an intellectual framework for risk identification, assessment, and monitoring, albeit manifested only in the private sector trade standards and not yet as a matter of public law in any meaningful sense.¹⁰⁵

Around the same time, a series of corporate scandals in the United Kingdom prompted the London Stock Exchange, the financial accounting firms, and the Financial Reporting Council, a U.K. regulator charged with promoting corporate governance and reporting norms, to establish a committee to make recommendations concerning financial aspects of corporate governance in the United Kingdom. The committee published the “Cadbury Report,” which stressed that boards of directors “maintain a system of internal control over the financial management of the company” and recommended that boards “make a statement,” to be “report[ed] thereon” by external auditors, regarding the effectiveness of the firm’s internal controls.¹⁰⁶ It was more modest than the COSO framework, likely because it carried the force of law.¹⁰⁷ Seven years later, U.K. accounting authorities published the Turnbull Report, which provided guidance concerning the suggestions set forth in the Cadbury Report.¹⁰⁸ The Turnbull Report highlights the conceptual inter-linkages between the management of compliance and information under the internal control rubric and risk management.¹⁰⁹ Particular attention was paid to allocation of responsibility: boards were to deliberate on risk tolerances, assessments, and limits; and management was responsible for designing, operating, and monitoring control systems that implement board policy. The system of

104. COSO Internal Controls Framework, *supra* note 100. The other components included the control environment, control activities, and information-and-communication. *Id.*

105. When bank regulators began to focus more extensively on risk management, the COSO internal controls framework became a reference point.

106. REP. OF THE COMM. ON THE FIN. ASPECTS OF CORPORATE GOVERNANCE ¶¶ 4.31–4.32 (1992), available at <http://www.ecgi.org/codes/documents/cadbury.pdf>.

107. The Cadbury Report recommendations were integrated into the U.K.’s corporate governance code, by which firms listed on the London Stock Exchange were bound. By contrast, the COSO framework was designedly aspirational.

108. The Cadbury Report was widely viewed as a portal through which risk management issues, more explicitly developed in the Turnbull Report, became part of enterprise control norms. See Alnoor Bhimani, *Risk Management, Corporate Governance and Management Accounting: Emerging Interdependencies*, 20 MGMT. ACCT. RES. 2, 2 (2009) (explaining that the Cadbury Report opened the door for enterprise control practices to include risk management).

109. See INST. OF CHARTERED ACCOUNTANTS IN ENGLAND & WALES, INTERNAL CONTROL: GUIDANCE FOR DIRECTORS ON THE COMBINED CODE ¶¶ 16-24 (1999), available at <http://www.ecgi.org/codes/documents/turnbul.pdf> (emphasizing the importance of reporting and information flow in its internal control objectives).

internal control should cover not only risk of non-compliance with law or unreliable financial reporting, but also such additional “significant business, operational, financial, compliance and other risks.”¹¹⁰ For this reason, the Turnbull Report has been described as “eviden[ce]” of the “COSO legacy” of risk-based internal control.¹¹¹

The Sarbanes-Oxley Act of 2002, enacted in response to a series of large accounting scandals at major U.S. companies, imposed a FDICIA-like mandate on all reporting companies subject to SEC periodic disclosure requirements. Specifically, Congress required these firms in section 404 (i) to certify the effectiveness of internal controls over financial reporting¹¹² and (ii) to arrange for their auditor to attest to such certifications.¹¹³ Although the Sarbanes-Oxley Act was enacted nearly ten years after the COSO internal controls framework had been published, its application to financial reporting alone, rather than risk more generally, limited its scope.¹¹⁴ The Sarbanes-Oxley Act further required the U.S. Sentencing Commission (USSC) to review and amend, as appropriate, the sentencing guidelines and related policy statements to ensure that the guidelines were “sufficient to deter and punish organizational criminal misconduct.”¹¹⁵ In performing that charge, the USSC amended the Organizational Sentencing Guidelines (OSG) in 2004 to provide for sentence reductions for defendant organizations that have implemented an “effective compliance and ethics program,”¹¹⁶ defined to incorporate board- and executive-level oversight, periodic re-assessment of legal risks, and communication to employees.¹¹⁷ The 2004 OSG amendments expanded on a series of earlier 1991 OSG amendments that provided incentives for corporations to implement legal compliance programs.¹¹⁸

110. *Id.* ¶ 20.

111. POWER, *supra* note 26, at 26.

112. 15 U.S.C. § 7262(a) (2006).

113. *Id.* § 7262(b).

114. This is not to suggest that the Sarbanes-Oxley Act as a whole was not significant. From the perspective of the senior executives and board members incurring potential civil and criminal liability in connection with their attestations concerning the effectiveness of internal controls over financial reporting, the Act effectuated a sea change in corporate governance. In 2012, Congress exempted a large class of issuers, known as “emerging growth compan[ies],” from the requirements of section 404. Jumpstart Our Business Startups Act, H.R. 3606, § 103 (2012).

115. Sarbanes-Oxley Act of 2002, Pub. L. 107-204, § 805(a)(5), 116 Stat. 745, 802 (2002).

116. U.S. SENTENCING GUIDELINES MANUAL § 8C2.5(f)(1) (2010).

117. *Id.* § 8B2.1(b).

118. See Richard E. Moberly, *Sarbanes-Oxley’s Structural Model To Encourage Corporate Whistleblowers*, 2006 B.Y.U. L. REV. 1107, 1134 n.125 (discussing amendments to the Sentencing Guidelines); Krawiec, *supra* note 74, at 497-98 (acknowledging that the OSG amendments, “[f]or all practical purposes, . . . require companies to adopt internal

C. Toward a Broader, More Comprehensive Risk Management

This sub-Part explains how bank regulators have sought to fulfill their mandate to monitor and protect the safety and soundness of banks, as well as the stability of the financial sector, by encouraging banks to develop an internal risk management infrastructure.¹¹⁹ These regulatory pronouncements took the form of guidance provided to banks and their examiners to be taken into account during the bank examination process, as well as more general guidance concerning the definitions of what constitutes an unsafe or unsound banking practice. The guidance would therefore serve as the basis for an enforcement action. Regulators saw risk management as a managerial antidote designed to control the instabilities engendered by the dizzying changes in the business of banking. In particular, regulators focused on the expansion of derivatives and securities activities, which they saw as requiring a new forward-looking risk management function beyond traditional internal control's focus on reliable compliance.¹²⁰ The previous sub-Part describes the process by which internal control, initially a technical and limited discipline designed to provide assurance with respect to legal compliance and financial reporting, began to be interpreted as a more comprehensive set of managerial responsibilities associated with risk control more generally. Bank regulators proved themselves innovators during this period as they attempted to influence the norms and techniques by which banks managed potential exposures, vulnerabilities, and opportunities.

By 2006, Chairman of the Federal Reserve Board of Governors Ben Bernanke would characterize “[regulators’] assessment of the quality of a bank’s procedures for evaluating, monitoring, and managing risk, and of the bank’s internal models for determining economic capital” as the “heart of the modern bank examination.”¹²¹ In 2008, Dan Tarullo noted that because the “risks associated with the complexity and pace of large bank activities cannot be effectively contained even with sophisticated rules . . . the emphasis increasingly has been on fostering robust risk management systems within the banks themselves.”¹²² Where, in other words, a review

compliance structures”).

119. For a summary of bank regulatory responsibilities with respect to safety-and-soundness and financial stability, see Weber, *supra* note 43, at 662-65.

120. See Crockett, *supra* note 68, at xi (presenting risk management as the “management of change”). Chorafas identifies technology, innovation, globalization, and deregulation as the predominant changes in financial services since the 1970s and 1980s. *Id.* at 8.

121. Bernanke Stonier School Remarks, *supra* note 2.

122. TARULLO, *supra* note 69, at 274; see also Bank Holding Company Rating System, 69 Fed. Reg. 70,444, 70,444 (Dec. 6, 2004) (“[A]s the banking industry has continued to evolve over the past decade, the focus of the Federal Reserve’s examination program for

of balance sheets and compliance with the law no longer assured a bank's safety and soundness, the internal system of corporate operating practices and systems that could give rise to vulnerabilities emerged as a critical regulatory object.¹²³ In 2010, the Federal Deposit Insurance Corporation (FDIC), which is responsible for examining state banks that are not members of the Federal Reserve System, took account of this new institutional focus in its own organizational structure when it renamed its examination office the Division of Risk Management Supervision.¹²⁴

The discussion below chronicles the emergence and evolution of risk management as a legal-regulatory subject during the 1980s and 1990s. A heightened awareness of financial risks, on account of rate volatility and "innovation" in derivatives markets, motivated bank regulators to adopt increasingly sweeping visions of risk management responsibilities of bank boards and managers. Bank regulators communicated their vision by publishing a rapid succession of supervisory letters, circulars, policy statements, bulletins, as well as rules and regulations subject to full notice-and-comment rulemaking procedures. As a result, the policy positions expressed in these regulatory pronouncements became part of the examination and rating process, as examiners would evaluate and discuss at length with bank management risk management practices in light of regulatory guidance.¹²⁵

bank holding companies has increasingly centered on a comprehensive review of financial risk and the adequacy of risk management."); CROUHY ET AL., *supra* note 50, at 21 (writing in 2001 that "the role of regulators has begun to shift to that of monitoring sophisticated banks' internal risk management systems").

123. See BD. GOVS. FED. RES. SYS., SR 95-51 (SUP), RATING THE ADEQUACY OF RISK MANAGEMENT PROCESSES AND INTERNAL CONTROLS AT STATE MEMBER BANKS AND BANK HOLDING COMPANIES (1995), *available at* <http://www.federalreserve.gov/boarddocs/srletters/1995/sr9551.htm> [hereinafter FRB GUIDELINES FOR RATING RISK MANAGEMENT] (asserting that "specific rating of risk management and internal controls should be given significant weight when evaluating management under [specific risk] rating systems").

124. F.D.I.C., 2010 ANNUAL REPORT 7, *available at* <http://www.fdic.gov/about/strategic/report/2010annualreport/AR10final.pdf>.

125. U.S. bank supervisors subject large banks to a continuous supervision regime. See, e.g., OFFICE OF THE COMPTROLLER OF THE CURRENCY, COMPTROLLER'S HANDBOOK: LARGE BANK SUPERVISION 17-21 (2010) (explaining that examination of large banks involves a periodic core assessment that culminates in a report from the OCC to the bank's board of directors as well as "various ongoing supervisory activities" and "targeted examinations"—i.e., integrated risk assessments by business or product line). Regulators usually rely on "the use of reason and moral suasion" as their "primary corrective tools." F.D.I.C., RISK MANAGEMENT MANUAL OF EXAMINATION POLICIES § 15.1 (2010). The use of these soft persuasive tactics occurs under the shadow of bank regulators' statutory powers (i) to order banks to remediate unsafe or unsound practices uncovered during examinations backed by specified and open-ended enforcement authority and (ii) to issue cease-and-desist orders with respect to unsafe or unsound practices. 12 U.S.C. §§ 1818(b) & 1831 (2006). The

A review of the selected regulatory actions analyzed below reveals *three predominant stages of risk management regulation* during this period: (i) responsibility allocation and internal risk control; (ii) threat description and control; and (iii) construction of a system of comprehensive enterprise protection. The first stage included regulatory efforts to respond to the new operating environment by defining the roles of boards of directors, senior managers, and the newly formed risk management departments. During the second stage, regulators heightened the particularity with which they treated risk, mandating specific procedures to plan for, monitor, assess, and manage risk, and describing how specific risk objects (e.g., credit risk, market risk, operational risk) should be controlled. The third stage articulated the broadest and most encompassing form of risk management regulation—a regulatory approach that conceived of risk management as an enterprise-wide program comprehending all exposures and their interconnections.

The stages are more thematic than strictly chronological, though a rough chronological order is evident, with the first stage dominating early phases of policy and giving way to the second stage and, eventually, the third stage in later phases. Two additional clarifications are in order. First, these descriptions are not comprehensive and are meant only to provide a broad overview of the general trends and approaches in the regulation of risk management practices, in particular how regulators saw them as a potential solution to problems posed by new market realities. Second, regulatory action pursuant to these themes was most often accretive and not substitutive, meaning that regulators periodically would add to the scope of risk management guidance without paring back previous obligations. One counter-intuitive aspect of this story is that as regulators expanded the scope of objects that banks would be required to control, their guidance became more demanding about the precision with which those objects would be controlled. The regulatory guidance gradually became characterized by an increasing degree of what Harvard Business School

FDIC has special authority to terminate deposit insurance for banks engaged in unsafe or unsound practices. § 1818(a)(2). The regulatory guidance concerning risk management thus provides a jurisdictional hook for regulators to jawbone bank management or, where appropriate, take corrective action. *See, e.g.*, OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC BULLETIN 2000-16, RISK MODELING 8 (2000) [hereinafter OCC MODEL VALIDATION GUIDANCE], available at http://ithandbook.ffiec.gov/media/resources/3676/occ-b12000-16_risk_model_validation.pdf (“[U]sing unvalidated models to manage risks to the bank is potentially an unsafe and unsound practice.”); FRB GUIDELINES FOR RATING RISK MANAGEMENT, *supra* note 123, at 4 (“An institution’s failure to establish a management structure that adequately identifies, measures, monitors, and controls the risks involved in its various products and lines of business has long been considered unsafe and unsound conduct.”).

Professor Anette Mikes has labeled “quantitative enthusiasm”: a preference for management of risk through precise calculation and measurement, coupled with a confidence in the robustness and accuracy of the mathematical models underlying the measurements.¹²⁶

1. Risk Management as Responsibility Allocation and Internal Control

The first stage of risk management regulation represents less of a novel regulatory approach than an effort to translate traditional board duties to oversee corporate affairs into a new operating environment in which risk acquired ever-greater salience. It is also characterized by an importation of internal control mandates into more contexts. This early story starts in the 1980s, perhaps unexpectedly with the Federal Home Loan Bank Board (FHLBB), the former regulator of federally chartered savings associations (known alternatively as “thrifts”) that by the end of the decade would be discredited and disbanded due to its perceived ineffectiveness in the lead-up to the savings-and-loan debacle.¹²⁷ During the early part of the decade, by force of necessity, the FHLBB was an innovator. Dramatic spikes in short-term interest rates created a crisis for the savings-and-loan industry, which held assets in the form of long-term mortgage loans. The FRB’s Regulation Q, which at that time capped interest rates on deposits, provided some initial support, but thrift depositors began to withdraw en masse in favor of investment vehicles unencumbered by Regulation Q, such as money market mutual funds (MMMFs), which were thus able to offer competitive rates.¹²⁸ Former FHLBB member Lawrence White’s describes the thrifts’ dilemma as follows:

With the rising MMMFs rapidly sucking deposits out of thrifts, Regulation Q was now at best an irrelevance and at worst a cause of disintermediation. Thrifts could try to prevent deposit withdrawals by paying higher interest rates. Indeed, this was tried in June 1978, when the [FRB] loosened Regulation Q slightly to allow banks and thrifts to pay market rates on [certain]

126. Anette Mikes, *Risk Management and Calculative Cultures*, 20 MGMT. ACCT. RES. 18, 35 (2009) [hereinafter *Calculative Cultures*].

127. It is testament to the enduring destabilizing force of housing finance in U.S. financial markets that the FHLBB’s successor, the Office of Thrift Supervision (OTS), was itself replaced in the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 on account of its failure to provide adequate supervision of several large thrifts and thrift holding companies. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. No. 111-203, §§ 313-314, 124 Stat. 1376, 1523-24 (2010).

128. LAWRENCE J. WHITE, *THE S&L DEBACLE: PUBLIC POLICY LESSONS FOR BANK AND THRIFT REGULATION* 67-71 (1991).

CDs . . . Thrifts, however, would then suffer operating losses, since the interest income from their mortgage portfolios would be insufficient to cover their interest costs. Or they could refuse to pay the higher interest rates, watch their deposits depart, and be forced to liquidate their low-interest mortgages at a loss in this high-interest environment. Either route meant losses. There was no way to avoid red ink.¹²⁹

In 1984, the FHLBB made an early attempt to influence risk management policy at depository institutions¹³⁰ in response to the short-term interest rate increases.¹³¹ The FHLBB noted that “[f]requent periods of interest-rate volatility make planning for the continued management of interest-rate risk a necessity.”¹³² The FHLBB promulgated a rule requiring each thrift board of directors to devise and adopt a series of policies to manage interest rate risk and senior management to implement those policies and report on them periodically to the board.¹³³ The FHLBB clarified that it did not intend “to intrude upon the business judgment of boards of directors of thrift institutions.”¹³⁴ Instead, its purpose was “to support responsible management in a task which it has already undertaken and to enable the [FHLBB] examiners to do their jobs more efficiently.”¹³⁵ In the accompanying statement of policy, the FHLBB stated that “[t]he interest-rate-risk management procedures . . . are intended to ensure that the boards of directors and management of insured institutions address the management of interest rate risk.”¹³⁶ Because one of the responses to increased volatility on the funding side (i.e., deposits) is to underwrite newer products on the asset side (e.g., the newly-approved adjustable-rate mortgages), the FHLBB was careful to instruct thrift boards not to lose

129. *Id.* at 69-70.

130. *See* Interest Rate-Risk Management: Proposed Policy Statement and Rule, 49 Fed. Reg. 19,307 (May 7, 1984) [hereinafter IRRM Proposal] (proposing several rules that would require the board of directors of each institution insured by the Federal Savings and Loan Insurance Corporation to develop and implement policies and procedures for management of interest rate risk).

131. Although the discussion in Part II.A emphasizes how derivatives motivated regulators to action with respect to risk management, for institutions such as thrifts that were restricted from transacting in derivatives markets, the increases in interest rate volatility and inflation constituted serious threats to safety and soundness in their own right.

132. Interest-Rate-Risk Management; Policy Statement and Final Rule, 49 Fed. Reg. 27,295, 27,295 (July 3, 1984) [hereinafter IRRM Final Rule].

133. *Id.* at 27,295-96. Responsibility for enforcement of the rule was eventually transferred to the OTS. Transfer and Recodification of Regulations Pursuant to Financial Institutions Reform, Recovery and Enforcement Act of 1989, 54 Fed. Reg. 49,411 (Nov. 30, 1989) (codified at 12 C.F.R. § 563.176); *supra* note 128 and accompanying text.

134. IRRM Proposal, *supra* note 130, at 19,308.

135. *Id.*

136. IRRM Final Rule, *supra* note 132, at 27,298.

sight of the multi-dimensionality of risk profiles.¹³⁷

The FHLBB proved itself a regulatory innovator in the risk management arena again when it developed similar responsibility-allocating guidelines in the 1988 Thrift Bulletin No. 12 with respect to what it referred to as “high-risk mortgage derivative products.”¹³⁸ One of the major policy responses to the problems posed by increased interest rates was to liberalize asset restrictions then in force. By expanding the range of assets thrifts were empowered to hold—for example, credit card and other consumer loans, commercial real estate loans, commercial loans, adjustable rate mortgages, and indirect equity positions—the FHLBB hoped that thrifts might achieve the required rates of return with higher-yielding assets that they would need to pay to attract and keep deposited funds.¹³⁹ But the FHLBB became concerned that thrifts were assuming risks that compromised their safety and soundness as a result of their new investment powers, including by speculating in derivatives.¹⁴⁰ The Federal Financial

137. *Id.* (adding the now superseded 12 C.F.R. 571.3(b)). Ten years later, the Farm Credit Administration (FCA) promulgated a similar rule governing board of director oversight of interest rate risk management for banks subject to the farm credit system. Funding and Fiscal Affairs, Loan Policies and Operations, and Funding Operations; Management of Investments, Liquidity, Interest Rate Risk, and Eligible Investments, 58 Fed. Reg. 63,034, 63,056-57 (Nov. 30, 1993). In 1998, the FCA refined the interest rate risk management requirements by amending the initial rule to require that the farm credit system banks “establish a risk management process that effectively identifies, measures, monitors, and controls interest rate risk.” Organization; Funding and Fiscal Affairs, Loan Policies and Operations, and Funding Operations; Disclosure to Shareholders; Title V Conservators and Receivers; Capital Provisions, 63 Fed. Reg. 39,219, 39,225 (July 22, 1998) (codified at 12 C.F.R. § 615.5180) [hereinafter FCA Interest Rate Risk Management Amendments]. The 1998 amendments also divided corporate responsibility for interest rate risk management in the same manner as the earlier FHLBB rule: the board of directors was charged with “developing” the interest rate risk management program and senior management was responsible for “ensuring that interest rate risk is properly managed on both a long-range and a day-to-day basis.” *Id.* Interestingly, though, the 1998 amendments charged the board, and not senior management (as with the FHLBB rule), with the “implementation” of the rule.

138. FEDERAL HOME LOAN BANK BOARD, THRIFT BULLETIN NO. 12, MORTGAGE DERIVATIVE PRODUCTS AND MORTGAGE SWAPS 2 (1988) [hereinafter THRIFT BULLETIN NO. 12], available at <http://www.occ.gov/static/news-issuances/ots/bulletins/rescinded-thrift-bulletins/ots-tb-12.pdf>.

139. See WHITE, *supra* note 129, at 72-74 (explaining that thrifts’ specialization was seen as a major cause of their problems, which could be solved by expanding the assets and liabilities the thrifts could hold).

140. See Investment Portfolio Policy and Accounting Guidelines: Proposed Rule; Proposed Statement of Policy, 53 Fed. Reg. 23,244, 23, 245 (proposed June 21, 1988) (“With the increased investment powers of savings institutions and the increased proliferation of types of securities, some insured institutions have expanded their investment activity into a variety of securities as an alternative to traditional lending activities.” (citation omitted)).

Institutions Examination Council (FFIEC)¹⁴¹ itself had published supervisory guidance for *all* bank and thrift examiners concerning these new securities activities in 1988,¹⁴² but the FHLBB went a step further, imposing a further set of procedural requirements on thrift boards and managers in addition to their post-1984 interest rate risk management responsibilities.¹⁴³

In Thrift Bulletin 12, the FHLBB introduced the problem posed by these instruments in terms of the dual nature of derivatives: “derivative products can be useful investment and hedging vehicles,” but “they may also expose an institution to considerable risk of loss if they are not managed in a safe and sound manner.”¹⁴⁴ The bulletin set forth guidance concerning board oversight; the need for a “comprehensive business plan” detailing risk management objectives (including position limits); the performance of “[s]ensitivity [a]nalysis” before investing in certain instruments;¹⁴⁵ the critical role of either management expertise or qualified third-party advisors; the establishment of internal controls; and awareness of potential credit risks posed by insolvent counterparties.¹⁴⁶ The mention of credit risk management was noteworthy since FHLBB and the FFIEC

141. Congress established the FFIEC in 1978 to develop a common set of supervisory standards to be used by all federal regulators of depository institutions. See RICHARD SCOTT CARNELL ET AL., *THE LAW OF BANKING AND FINANCIAL INSTITUTIONS* 632 (4th ed. 2008) (detailing the FFIEC’s composition and its role in promoting regulatory coordination among multiple agencies). The membership of the FFIEC includes the OCC, the FRB, the FDIC, and the National Credit Union Administration. *Id.*; see also *supra* note 127 (explaining that the OTS no longer exists).

142. See, e.g., Supervisory Policy Statement Concerning Selection of Securities Dealers, Securities Portfolio Policies and Strategies and Unsuitable Investment Practices, and Stripped Mortgage-Backed Securities, Certain CMO Tranches, Residuals, and Zero-Coupon Bonds: Request for Comment, 56 Fed. Reg. 263 (Jan. 3, 1991) (noting that all member agencies of FFIEC except FHLBB had adopted FFIEC’s 1988 supervisory guidance); Supervisory Policy Concerning Selection of Securities Dealers and Unsuitable Investment Practices, 53 Fed. Reg. 14,852 (Apr. 26, 1988) [hereinafter *Unsuitable Investment Practices*] (adopting FFIEC supervisory policy, which banned or restricted certain classes of securities, to apply to institutions subject to FRB supervision). The FFIEC guidance did not address risk management in anywhere near the level of detail that the FHLBB did with its Thrift Bulletin 12. The single instance of risk management regulation in the FFIEC guidance was its instruction to bank boards to develop and document “plans prescribing specific positioning limits and control arrangements for enforcing these limits” for investments in “stripped mortgage backed securities.” *Id.* at 14,855.

143. THRIFT BULLETIN NO. 12, *supra* note 138, at 1.

144. *Id.*

145. The sensitivity analysis is an early example of regulator-administered stress testing. The FHLBB “strongly recommended” a series of stress scenarios that thrifts should consider before investing. *Id.* at 2.

146. *Id.* at 3-4. The gradual broadening of risk management regulation into credit and other non-interest rate risks anticipates the second stage of risk management regulation discussed below in Part II.C.1.

had previously focused exclusively on interest rate risk.

A year later, the FHLBB published a more comprehensive investment portfolio policy statement applying to *all* investment activities of thrifts, including investing in derivatives.¹⁴⁷ Again, the FHLBB emphasized the importance of a “written investment policy” setting forth the board’s vision of the “appropriate investment course for the institution, given the present financial position of the institution and the current and reasonably anticipated economic environment.”¹⁴⁸ Further, thrift management would be required to develop “investment strategies that set out, in reasonable detail, the manner in which the investment policy [would be] implemented”—including, for example, the “acceptable range of interest rate risk for each type of security.”¹⁴⁹ Specifically, in setting the interest rate risk management strategies, management should include planned organizational responses to different interest rate environments and other “external factors that past history and current events support as being reasonable.”¹⁵⁰ “Reasonabl[e] foreseeab[ility]”¹⁵¹ was undefined, left for deliberation by thrift management. The FHLBB observed that its guidance on securities-related risk management flowed from the interaction of the regulatory goal of safety and soundness, a board’s duty of care, and the need for an adequate internal control environment.¹⁵² In this respect, the FHLBB presaged the key theme picked up on again in the *Caremark* case, the Cadbury Report, and the COSO internal controls framework. But in certain respects, the policy statement went further in that it allocated responsibility for establishing systems that would navigate risks that threaten the achievement of the board’s entire investment strategy, though without specifying what those risks entail.

147. See Investment Portfolio Policy and Accounting Guidelines: Final Rule; Final Statement of Policy, 54 Fed. Reg. 23,457, 23,458 n.1 (June 1, 1989).

148. *Id.* at 23,463.

149. *Id.*

150. *Id.* GAAP accounting treatment provided (and still provides) that only held-for-investment (now known as “held-to-maturity”) securities can be accounted for using amortized cost accounting – the method that thrifts favored during the 1980s because the amortized cost was usually higher than the market values that would otherwise apply. See *id.* (explaining that amortized cost accounting can only be used when there is a positive intent and ability to hold the security to maturity). With the investment portfolio policy statement, the accounting rules interacted with the corporate governance implications of the investment risk management policies. Specifically, the bounds of reasonable foreseeability, as set by management, delimited the range of circumstances in which thrifts could sell held-for-investment securities. If management believed a set of circumstances to be outside its reasonable forecast and to require divestment of otherwise held-for-investment securities, it would be required to document its belief. *Id.*

151. *Id.*

152. *Id.* at 23,465-66 (mandating that management document changes to valuation methods resulting from circumstances that arise outside the range of foreseeable events).

Early international attempts to shape derivatives risk management were similarly limited to responsibility allocation and internal control. International bank regulators, including most prominently the Basel Committee on Banking Supervision (Basel Committee),¹⁵³ made initial forays into risk management to address a problem that U.S. bank regulators had not yet addressed. Its *Management of Banks' Off-Balance-Sheet Exposures* paper, published in 1986, provided guidance to banks concerning risk management practices for derivatives and other off-balance sheet exposures. Noting that off-balance-sheet exposures—including, most prominently, derivatives¹⁵⁴—“raise particular difficulties in view of the[ir] complexity,” the Basel Committee warned that “banks run the risk of losses arising from any failure to apply adequate control systems.”¹⁵⁵ The Committee’s solution was to remind banks of the importance of internal controls¹⁵⁶ and instruct bank boards as follows:

[B]ank boards need formal written policies to govern all trading activities. While the ability to make quick decisions is undoubtedly a key factor in the current environment, banks may need to re-examine the structure of their risk assessment and accounting systems, as well as current management procedures, in order to ensure that decisions are taken with an informed appreciation of the risks.¹⁵⁷

A year later, the Bank of England “stated that banks’ records and internal controls should identify risk exposure limits, particularly those related to derivatives, monitor compliance with such limits, properly value positions, and ensure that management was adequately informed.”¹⁵⁸ In 1990, France’s Banking Commission promulgated a rule requiring banks to set and monitor compliance with limits on risk exposure in connection with

153. The Basel Committee is a standing committee composed of bank regulators from major developed nations that, among other things, develops important guidelines and supervisory standards for bank regulators to implement in their home jurisdictions. Central bank governors and bank supervisors from the Group of Ten nations founded the Basel Committee in 1974 under the auspices of the Bank for International Settlements to address the immediate problems arising in connection with the collapse of Bankhaus Herstatt and Franklin National banks. Robert F. Weber, *New Governance, Financial Regulation, and Challenges to Legitimacy: The Example of the Internal Models Approach to Capital Adequacy Regulation*, 62 ADMIN. L. REV. 783, 800 (2010).

154. The Basel Committee also cited guarantees, lending commitments, and underwriting commitments as off-balance sheet exposures requiring special attentiveness to risk build-up.

155. MANAGEMENT OF OFF-BALANCE SHEET EXPOSURES, *supra* note 61, at 13.

156. *Id.* at ¶ 46.

157. *Id.* at ¶ 47.

158. GAO DERIVATIVES REPORT, *supra* note 67, at 114.

interest rate swaps.¹⁵⁹ In 1991 and 1992, respectively, Swiss and Singaporean bank regulators published guidance for domestic banks transacting in derivatives markets that emphasized the importance of effective internal control systems.¹⁶⁰

2. Risk Management as Threat Description and Control

During the second stage of risk management regulation, Congress and bank supervisors expanded their attention from responsibility allocation and internal control to developing more specific requirements that banks monitor and exert control over a greater array of specified risks. Congress set the tone for this next stage in a rarely examined provision of the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA). As noted earlier, the FHLBB, likely on account of the unique interest rate risk vulnerabilities of the thrift institutions it supervised,¹⁶¹ acted first to address interest rate risk in 1984.¹⁶² While the thrift industry accounted for an outsized proportion of the interest rate risk problems of the 1980s, it quickly became apparent that these problems, borne of new financial innovations and increased rate volatility, could affect all financial institutions equally. In response, Congress enacted FIRREA. From a risk management perspective, FIRREA is noteworthy because it marks the first time that Congress addressed risk management at financial institutions as a legislative subject. Specifically, Congress instructed federal financial institution regulators to conduct a study of “[t]he feasibility of developing and administering . . . an examination of the principles and techniques of risk management and the application of such principles and techniques to the management of insured institutions.”¹⁶³ Congress also directed the FFIEC¹⁶⁴ to “develop and administer training seminars in risk management” for bank examiners and bank personnel.¹⁶⁵ The open-ended charge afforded wide discretion to regulators to elaborate risk management norms concerning an equally open-ended array of risks.

159. *Id.*

160. *Id.*

161. See Joint Agency Policy Statement: Interest Rate Risk, 61 Fed. Reg. 33,166, 33,169 (June 26, 1996) [hereinafter Final Joint Agency Policy on Interest Rate Risk] (distinguishing commercial banks from thrifts on the grounds that the former “do not hold high concentrations” of “residential mortgage assets, especially adjustable rate mortgages”).

162. See *supra* notes 131-138 and accompanying text (describing the FHLBB’s activities in the 1980s to address this risk).

163. Financial Institutions Reform, Recovery, and Enforcement Act of 1989, Pub. L. 101-73, § 1001(b)(9), 103 Stat. 183, 508 (1989).

164. See *supra* note 142 (explaining the FFIEC’s role as standard setter for bank examinations).

165. *Id.* § 1218, 103 Stat. at 546 (codified at 12 U.S.C. § 3309).

In 1992, the FFIEC followed the FHLBB's lead when it published a new supervisory policy on securities activities, largely replicating the FHLBB's earlier guidance concerning investment policies and high-risk mortgage products and applying it to all federally regulated banking institutions.¹⁶⁶ Notably, however, the FFIEC specifically required banks to consider, in addition to interest rate risk, other risk factors such as: asset-liability mismatching, asset concentration risk, liquidity risk, credit risk, market volatility risk, and "management's capabilities"¹⁶⁷ – an early reference to a new category of risk that later would be labeled "operational risk."¹⁶⁸ If FIRREA signaled to bank regulators congressional expectations that they develop more detailed risk management guidance, the 1992 policy initiated a period during which the regulators sharpened their focus on the specific risks that banks should be managing.

In 1993, the OCC published Circular 277, entitled *Risk Management*

166. See Supervisory Policy Statement on Securities Activities, 57 Fed. Reg. 4,028 (Feb. 3, 1992) (updating and revising the FFIEC's policy on selection of securities dealers and requiring the establishment of prudent policies for transactions). Once the FFIEC issued its policy statement concerning risk management of securities activities, the FHLBB removed its earlier investment portfolio policy statement and Thrift Bulletin 12 concerning, respectively, securities activities and mortgage derivatives. Investment Portfolio Policy and Accounting Guidelines: Final Rule; Removal of Statement of Policy and Conforming Amendments, 57 Fed. Reg. 26,989 (June 17, 1992); OFFICE OF THRIFT SUPERVISION, THRIFT BULLETIN NO. 52, SUPERVISORY STATEMENT OF POLICY ON SECURITIES ACTIVITIES (Jan. 10, 1992). For a discussion of these superseded policies, see *supra* notes 138-152 and accompanying text.

167. Supervisory Policy Statement on Securities Activities, 57 Fed. Reg. at 4034; see also Investment Portfolio Policy and Accounting Guidelines: Final Rule; Removal of Statement of Policy and Conforming Amendments, 57 Fed. Reg. at 26,989-90 (setting forth Section II of the policy statement regarding "policies and strategies"). Another notable aspect of the 1992 supervisory policy took the form of a technology-based, structural regulatory rule applying certain conservative accounting rules to mortgage-related derivatives meeting any of three supervisory tests, known as "high-risk tests," that gauged the perceived riskiness of the derivative. Supervisory Policy Statement on Securities Activities: Statement of Policy, 57 Fed. Reg. at 4,031 (setting forth Section III of the policy statement regarding "Mortgage Derivative Products, Other Asset Backed Products, and Zero-Coupon Bonds"). The contrast between the high-risk test rule and the risk management guidelines recalls the Coglianesse-Lazer distinction between technology-based regulation and management-based regulation: the former is a structural, top-down, technology-based rule that was already very nearly an anachronism at that stage, whereas the latter are classic examples of ambitious management-based regulation. See *supra* notes 30-37 and accompanying text (explaining differences between technology-based regulation and management-based regulation). Regulators would struggle with this sort of methodological choice throughout this period, nearly always eschewing technology-based regulation on the grounds that, as noted by Tarullo, the "risks associated with the complexity and pace of large bank activities cannot be effectively contained even with sophisticated rules." TARULLO, *supra* note 69, at 274.

168. BASEL II FRAMEWORK, *supra* note 55, at 144.

of *Financial Derivatives*.¹⁶⁹ When it was issued, the Circular was the most comprehensive regulatory taxonomy of risks and description of regulatory expectations with respect to risk management practices. The largest banks have always been the most significant derivatives dealers because they are perceived as the most stable counterparties due to their massive balance sheets and access to government safety nets. It is not surprising, then, that the OCC—which is charged with the supervision of federally chartered banks such as today’s J.P. Morgan Chase, Bank of America, and Citigroup—was the first regulator to address risk management norms in a systematic manner. The Circular addressed market, credit, liquidity, legal, and operational risks. It applied to all national banks, though the OCC recognized that banks that were dealers or active position takers would likely require more extensive risk management programs than banks that were more limited end-users of derivatives (e.g., for hedging purposes).¹⁷⁰

Circular 277 recited as its basic premise the dual nature of derivatives¹⁷¹ and noted the OCC’s position that “the best defense against sizeable individual losses or significant systemic disruptions is the implementation and use by individual banks of sound and efficient risk management systems.”¹⁷² If properly designed, such systems “should prevent significant losses due to counterparty failure or adverse changes in market conditions.”¹⁷³ National banks were to implement “comprehensive risk management systems” to “ensure that market factors affecting risk exposures are adequately measured, monitored, and controlled.”¹⁷⁴ The OCC nodded its head in approval at the “sophisticated approaches” to managing derivatives-related risks that several banks had developed, and it indicated that it expected banks themselves to develop the content of the risk management norms.¹⁷⁵

For banks that offered dealer services or conducted trading operations, the systems would need to quantify market risk exposures as well as “facilitate stress testing and enable management to assess the potential impact of various changes in market factors on earnings and capital.”¹⁷⁶ In performing the stress tests, banks were directed to evaluate risk exposures under various scenarios that represent a broad range of potential market

169. OFFICE OF THE COMPTROLLER OF THE CURRENCY, BANKING CIRCULAR No. 277, RISK MANAGEMENT OF FINANCIAL DERIVATIVES (1993) [hereinafter OCC CIRCULAR 277].

170. *Id.* at 15, 21.

171. *See supra* notes 56-62 and accompanying text (discussing how derivatives are used to both enhance and minimize market exposure).

172. OCC CIRCULAR 277, *supra* note 170, at 4.

173. *Id.*

174. *Id.* at 8.

175. *Id.* at 1.

176. *Id.* at 9.

movements and corresponding price declines.

As for credit risk, banks were required to ensure that derivatives transactions were authorized and consistent with risk management policies. Again, the OCC emphasized the need to quantify exposures, this time by producing a “number representing a reasonable approximation of loan equivalency, that is, the amount of credit exposure inherent in a comparable extension of credit.”¹⁷⁷ The exposure quantity would take into account current exposure and a more opaque “credit risk add-on” charge that represented “the likelihood that market rates or prices will change over the life of a contract.”¹⁷⁸

These risk management systems would contain exposure limits with respect to credit risk and “inter-connected risk positions” and regular reporting to senior management and the board of directors.¹⁷⁹ In a preview of the next thematic stage of risk management regulation, the OCC noted that bank management should make efforts to “develop the ability . . . to determine the aggregate risk profile of the institution.”¹⁸⁰ In addition to the risk management systems, the Circular dictated that a risk management infrastructure should include: (i) comprehensive written policies, reviewed by senior management and endorsed by the board of directors, governing the use of derivatives; (ii) a dedicated risk management unit or individual responsible for “measuring and reporting” exposures;¹⁸¹ and (iii) audit coverage of derivatives-related risks by auditors independent of the units transacting in derivatives.¹⁸²

Two months after the OCC published Circular 277, the FRB issued Supervisory Letter 93-69, which provided guidance with respect to the risk management of securities and derivatives trading activities for FRB-regulated banks.¹⁸³ Supervisory Letter 93-69 largely tracked the content of

177. *Id.* at 13.

178. *Id.*

179. *Id.* at 8.

180. *Id.* at 10.

181. *Id.* at 7.

182. *Id.* at 7-13. The Circular did not require an outside audit of derivatives activities.

183. The terms of Supervisory Letter SR 93-69 specifically targeted the operating companies and branches subject to FRB supervision: state banks that are members of the Federal Reserve System, branches and agencies of foreign banks, and FRB-chartered affiliates of bank holding companies conducting international banking business (named “Edge [Act] corporations” after the 1919 Edge Act that added section 25A to the Federal Reserve Act). BD. GOV. FED. RES. SYS., SR 93-69 (FIS), EXAMINING RISK MANAGEMENT AND INTERNAL CONTROLS FOR TRADING ACTIVITIES OF BANKING ORGANIZATIONS 1 (1993). The FRB noted, however, that the principles in the Letter applied equally to FRB-regulated holding company systems and directed holding company examiners to “assess management’s application of [the] guidance to the holding company . . . where appropriate.” *Id.*

Circular 277. Specifically, the Letter emphasized three elements required of risk management systems: (i) board and management oversight; (ii) a risk management process comprised of a “comprehensive risk measurement approach,”¹⁸⁴ detailed limits and parameters governing risk taking, and a strong communication system for monitoring and reporting risk exposures within the bank; and (iii) internal controls and audit procedures.¹⁸⁵ It too made overtures to a more comprehensive form of risk management that would aggregate risk exposures throughout the institution using a common set of parameters, though it ultimately urged the integration of the mandatory risk management processes into the institution’s overall risk management system “to the fullest extent possible.”¹⁸⁶

From a corporate governance perspective, Circular 277 and Supervisory Letter 93-69 represented a new, albeit imprecise, venture into competences previously considered the exclusive purview of management and the board of directors: setting risk limits, communication lines, and internal audit procedures. While the latter two concerns are arguably part of any internal controls program, the establishment of risk limits was a new and noteworthy regulatory development, though the OCC left the methods by which the risk limits were to be formulated undeveloped.

For its part, the Basel Committee expanded on its 1986 guidance¹⁸⁷ when it published a 1994 paper entitled *Risk Management Guidelines for Derivatives*.¹⁸⁸ The 1994 guidance sounded the same themes as OCC Circular 277: board and management oversight, internal controls and audits, and the newer requirement of a “risk management process.”¹⁸⁹ The guidance pertaining to oversight was anodyne, simply applying the near-universal precept that management assumes responsibility for the policies for conducting business while the board approves significant policies relating to the management of risks throughout the institution. The guidance for internal controls and audits was similarly uneventful. Importantly, however, the Basel Committee agreed with the OCC that where a firm engages in large-scale derivatives activities, it should establish an independent risk management unit. But the Basel Committee went further than the OCC, stating that the “personnel staffing independent risk management functions should have a *complete* understanding of the

184. *Id.* at 3.

185. *Id.* at 1-3.

186. *Id.* at 3.

187. See *supra* notes 155-158 and accompanying text for a discussion of the Basel Committee’s early work.

188. BASEL RISK MANAGEMENT GUIDELINES, *supra* note 47, at 5.

189. *Id. passim.*

risks associated with *all* of the bank's derivatives activities."¹⁹⁰ Before engaging in new derivatives activities, management was instructed to conduct "an analysis of the risks that may arise from the activities."¹⁹¹ The novelty of the guidance is, as with Supervisory Letter 93-69 and Circular 277, its discussion of the "risk management process" itself.

As mentioned earlier, Congress enacted FDICIA in 1991, overhauling many of the laws concerning bank supervision and resolution.¹⁹² Section 305 of FDICIA constituted another intrusion into risk management practices by federal authorities. Specifically, it instructed all federal banking regulators to incorporate consideration of interest rate risk into the capital adequacy regime.¹⁹³ Federal regulators jointly implemented this directive after an extensive rulemaking process through two regulatory actions. First, they revised capital standards to "explicitly include a bank's exposure to declines in [its] economic value due to changes in interest rates as a factor that [regulators would] consider when evaluating . . . capital adequacy."¹⁹⁴ Second, they published a *Final Joint Agency Policy on Interest Rate Risk*, which identified the key elements of what regulators would consider sound management of interest rate risk.¹⁹⁵ The revisions to the capital standards, published in 1995, amounted to little more than an expression of regulators' intention to take interest rate risk into consideration. In other words, instead of assessing a specific capital charge for interest rate risk as Congress intended, they implemented section 305 by tautology. The regulators referred to this approach, which relied on a combination of "quantitative and qualitative factors," as a "'risk assessment' approach."¹⁹⁶ At the time, however, regulators saw the risk assessment approach as a short-term solution and anticipated replacing the provisory risk assessment approach with an explicit minimum capital charge.¹⁹⁷

While deliberating on the optimal form for the minimum capital charge, the FRB, OCC, and FDIC took note that the banks under their supervision had "been offering and holding a growing variety of products .

190. *Id.* at 5 (emphasis added).

191. *Id.*

192. *See supra* notes 96-98 and accompanying text (discussing the changes following the savings and loan crisis).

193. Federal Deposit Insurance Corporation Improvement Act of 1991, Pub. L. 102-242, § 305, 105 Stat. 2236, 2354 (1991). Section 305 also addressed credit concentration risk and the risks of "nontraditional activities." *Id.*

194. Risk-Based Capital Standards: Interest Rate Risk, 60 Fed. Reg. 39,490, 39,491 (Aug. 2, 1995).

195. *Final Joint Agency Policy on Interest Rate Risk*, *supra* note 162, at 33,166.

196. *Id.* at 33,169.

197. *See id.* at 33,167 ("The intent of the agencies at that time was to implement an explicit minimum capital charge for interest rate risk at a future date . . .").

. . . such as certain collateralized mortgage obligations and structured notes” and that “a variety of pricing indices and embedded options [were now] incorporated into their commercial and retail bank products.”¹⁹⁸ These exposures complicated the ability of bank regulators to construct a set capital charge that apportioned an appropriate amount of capital to cover the array of new, often firm-specific, exposures. In the face of their uncertainty, the regulators responded with an unconventional solution: they would retain the risk assessment approach indefinitely and instead seek to influence the risk management process directly by making the quantitative and qualitative factors a permanent feature of capital regulation. In most cases, the regulators would administer the quantitative factors by looking to the estimates generated by the banks’ internal risk management systems.¹⁹⁹ The regulators would gauge the qualitative factors by evaluating “whether a bank follows sound risk management practices for interest rate risk when assessing its aggregate interest rate risk exposure and its need for capital.”²⁰⁰ The regulators provided guidance concerning their recommendations for sound risk management. Specifically, those recommendations included both substantive requirements and procedural corporate governance elements. The substantive requirements mandated that banks put in place the following:

[p]olicies and procedures designed to control the nature and amount of interest rate risk the bank takes, including those that specify risk limits and define lines of responsibilit[y] and authority for [risk management];
[a] system for identifying and measuring interest rate risk;
[a] system for monitoring and reporting risk exposures; and
[a] system of internal controls, review, and audit to ensure the integrity of the . . . risk management [function].²⁰¹

Boards were instructed to: (i) “establish and guide” the bank’s risk tolerance (including by setting risk limits);²⁰² (ii) identify persons responsible for managing risk;²⁰³ (iii) ensure adequate resources are devoted to risk management; and (iv) monitor the bank’s overall risk

198. Final Joint Agency Policy on Interest Rate Risk, *supra* note 161, at 33,168-69.

199. Risk-Based Capital Standards: Interest Rate Risk, 60 Fed. Reg. at 39,491.

200. Final Joint Agency Policy on Interest Rate Risk, *supra* note 162, at 33,169.

201. *Id.* at 33,170.

202. *Id.*

203. *Id.* The responsibilities to be allocated pertained to the identification of potential interest rate risk arising from existing or new products or activities, the establishment and maintenance of an interest rate risk measurement system, the formulation and execution of strategies to manage interest rate exposures, and the authorization of exceptions to risk management policies. *Id.* at 33,171.

profile.²⁰⁴ Senior management, on the other hand, was to: (i) translate the board's risk tolerance into implementable policies; (ii) ensure adherence to lines of responsibility established by the board; (iii) oversee the implementation and maintenance of systems that "identify, measure, monitor, and control" interest rate risk; and (iv) establish "internal controls . . . to ensure the integrity of the . . . risk management process."²⁰⁵ This expansive treatment of interest rate risk management recalled several of the key principles animating the OCC and FRB treatment of risk management for derivatives in OCC Circular 277 and FRB Supervisory Letter 93-69.

While the FFIEC and its member agencies articulated their expectations for what risk management systems should look like, they were contemporaneously working to incorporate those new norms into their supervisory rating system. The FFIEC amended its Uniform Financial Institutions Ratings System (UFIRS) system for rating depository institutions for supervisory examination purposes to include express consideration of risk management.²⁰⁶ The UFIRS rating system, known more commonly as CAMELS,²⁰⁷ was adopted in 1979 to provide a uniform basis for evaluating the soundness of depository institutions and a means of identifying institutions requiring special supervisory attention or concern.²⁰⁸ Under the UFIRS, each depository institution is assigned a composite rating based on an evaluation and rating of essential components of an institution's financial condition and operations: the adequacy of capital, the quality of assets, the capability of the board of directors and management, the quality and level of earnings, the adequacy of liquidity, and the sensitivity to market risk. The 1996 amendments, among other things, incorporated sensitivity to market risk as a component for the first time and instructed examiners to accord "increasing emphasis on the quality of risk management processes *in each of the component ratings*, particularly in the Management component[.]"²⁰⁹ In making the changes, the FFIEC incanted the traditional story dogma that risk management was an antidote to the new risk profiles of banks:

Changes in the financial services industry, however, have

204. *See id.* at 33,170 (calling specifically for determining "lines of authority and responsibility").

205. *Id.*

206. Uniform Financial Institutions Rating System, 61 Fed. Reg. 67,021 (Dec. 19, 1996).

207. CAMELS is an acronym standing for Capital adequacy, quality of Assets, capability of Management, Earnings quality, Liquidity adequacy, and Sensitivity to market risk. The 1996 amendments incorporated consideration of market risk sensitivity for the first time; prior to that point, UFIRS was referred to as CAMEL with the "S" omitted. *Id.*

208. *Id.* at 67,022.

209. *Id.* at 67,022 (emphasis added).

broadened the range of financial products offered by institutions and accelerated the pace of transactions. These trends reinforce the importance of institutions having sound risk management systems. Accordingly, the revised rating system contains explicit language in each of the components emphasizing management's ability to identify, measure, monitor, and control risks.²¹⁰

Since 1979, the FRB has had a separate supervisory rating system (known as BOPEC) for its examination of bank holding company systems. By the time the FFIEC published its UFIRS amendments, the FRB had already issued a supervisory letter in 1995 incorporating consideration of risk management into the management component of the UFIRS and BOPEC ratings for FRB-regulated institutions.²¹¹ In 2004, the FRB eliminated BOPEC altogether and replaced it with a new bank holding company rating system, known by the cumbersome acronym RFI/C(D), that requires a standalone assessment of risk management.²¹²

3. Risk Management as Comprehensive Enterprise Protection

The third thematic phase of risk management regulation is characterized by increased quantitative enthusiasm and confidence in the ability of banks to manage their exposures on a comprehensive, enterprise-wide basis by understanding interconnections among exposures and aggregating them with common risk metrics. In certain respects, this was a return to first principles: a reminder both that the board of directors and executives were responsible for risk policy design and implementation, and that mechanical application of technical know-how on a portfolio-by-portfolio basis and a risk-by-risk basis was not adequate.²¹³ No longer would it be enough to put in place risk limits and policies; risk needed to be managed across and throughout financial conglomerates. In this respect,

210. *Id.* at 67,023-24.

211. Supervisory Letter 95-51, which has since been superseded by the RFI/C(D) ratings system discussed in the subsequent footnote, instructed examiners to assign a formal supervisory rating to the adequacy of FRB-regulated institutions' risk management systems, to be "given significant weight" when evaluating the management component of the UFIRS and the FRB's supervisory rating system for bank holding companies (known at the time as BOPEC). See FRB GUIDELINES FOR RATING RISK MANAGEMENT, *supra* note 123124.

212. Bank Holding Company Rating System, 69 Fed. Reg. 70,444 (Dec. 6, 2004). The risk management (R) component from the new RFI/C(D) system is "based on the same guidance that has been used to rate risk management since 1995"—i.e., since the issuance of Supervisory Letter 95-51. *Id.* at 70,445.

213. See DAS, *supra* note 27, at 4 (explaining difference between "trading risk management"—or "micro risk management at the level of individual traders and trading desks"—and "firm wide risk management"—which focuses on "matching risk . . . with capital to ensure the ability of the [entire] firm to absorb trading risk").

the regulatory guidance must be considered alongside the burgeoning field of enterprise risk management (ERM).

Though bank regulators largely avoided the ERM term, they embraced its almost utopian pretension of total risk control. As a reminder that the stages of risk management highlighted in this Part are more thematic than strictly chronological, consider the Basel Committee's 1986 preview of ERM (before it was known as such):

It is not sufficient, however, to concentrate on the specific risks of individual instruments. Central coordination and control of the totality of the risk involved in trading in a variety of different instruments is also important because of the linkages between them. This is no easy task. Since it is obviously more difficult for banking groups with extensive decentralized branch networks and extended corporate structures to coordinate their operations than for single compact units, attention also has to be paid to the need for high standards of group control and for a worldwide consolidated approach to the supervision of risks, both on and off the balance sheet.²¹⁴

At the time the Basel Committee did not develop the notion further. By 2004, however, COSO had published *Enterprise Risk Management—Integrated Framework*, which built on the earlier internal controls framework²¹⁵ and purported to direct information flows regarding risk within an organization so as to “strike an optimal balance between growth and return goals and related risks” and “effectively deploy[] resources in pursuit of the entity’s objectives.”²¹⁶ The COSO framework noted that, “[i]n sum,” ERM “helps an entity get to where it wants to go and avoid pitfalls and surprises along the way.”²¹⁷ The COSO ERM framework identifies eight “components” of ERM: (1) the firm’s internal environment must set the tone for how risk is viewed and addressed; (2) management must identify objectives in order to properly identify risks that compromise the firm’s objectives; (3) events affecting the achievement of firm goals (both risks and opportunities) must be identified and communicated to management for purposes of re-evaluating firm strategy and objectives; (4) risk must be assessed according to probability and impact; (5) management must select responses to identified risks; (6) controls must be established to track firm progress; (7) relevant information must be identified, captured,

214. MANAGEMENT OF OFF-BALANCE SHEET EXPOSURES, *supra* note 61, at 14.

215. See *supra* notes 9899-104105 and accompanying text for a description of the COSO internal controls framework.

216. COMM. OF THE SPONSORING ORGS. OF THE TREADWAY COMM’N, ENTERPRISE RISK MANAGEMENT—INTEGRATED FRAMEWORK 1 (2004) [hereinafter COSO ERM FRAMEWORK], available at http://www.coso.org/documents/coso_erm_executivesummary.pdf.

217. *Id.*

and communicated in a form and timeframe that enables responsible parties to perform; and (8) the entire ERM infrastructure must be monitored and modified as necessary.²¹⁸ The framework resonated with the development of so-called economic capital modeling, which referred to the quantitative techniques by which banks and other financial institutions would allocate capital to business lines, product categories, portfolios, and individual assets consistent with mathematical estimates of risks across the institution as a whole.²¹⁹ The COSO ERM framework, like the COSO internal controls framework, is not a source of law itself, but rather its pretensions to comprehensive risk control help frame the third thematic phase of risk management regulation.

For instance, the FFIEC articulated a broad ERM-type vision in a 1998 policy statement that it heralded as a new comprehensive “risk-based supervision approach” to bank examination.²²⁰ The policy statement, titled *Supervisory Policy Statement on Securities Activities and End-User Derivatives Activities*, supplemented the 1996 *Final Joint Agency Policy on Interest Rate Risk*²²¹ and replaced the 1992 *Supervisory Policy Statement on Securities Activities*.²²² The earlier 1992 policy statement had, as noted above, subjected several types of derivatives to so-called “high risk tests” to determine their accounting treatment.²²³ In the years leading up to the 1998 re-work of the policy, FFIEC members began to question the effectiveness of the “pass/fail criteria of the high risk tests[.]”²²⁴ In particular, they feared that the specification of the tests had dulled the

218. *Id.* at 3-4.

219. See Esa Jokivuolle, *Aligning Regulatory Capital with Economic Capital*, in RISK MANAGEMENT: A MODERN PERSPECTIVE, *supra* note 24, at 455 (noting the importance of consistently applying minimum capital requirements to all banks regardless of the institutions’ own perspectives on capital requirements).

220. OFFICE OF THE COMPTROLLER OF THE CURRENCY, NO. OCC 1998-20, POLICY STATEMENT ON INVESTMENT SECURITIES (1998), available at <http://www.occ.gov/news-issuances/bulletins/1998/bulletin-1998-20.html>.

221. See *supra* notes 196-206 and accompanying text for details of the publication. The scope of the new policy statement was broad, though it excluded derivatives transactions that were recorded as trading transactions. See *Supervisory Policy Statement on Investment Securities and End-User Derivatives Activities*, 63 Fed. Reg. 20,191, 20,194 (Apr. 23, 1998) (defining the scope of the guidance as including money market instruments, different types of notes, asset-backed securities, and mortgage derivative products). See also *Risk-Based Capital Standards: Market Risk*, 61 Fed. Reg. 47,358 (Sept. 6, 1996) (noting that transactions recorded on the trading account were already subject to separate supervisory treatment under the 1996 risk-based capital regime applicable to market risk exposures).

222. See *supra* notes 167-168 and accompanying text for details regarding the *Supervisory Policy Statement*.

223. *Supervisory Policy Statement on Securities Activities*, *supra* note 166.

224. *Supervisory Policy Statement on Investment Securities and End-User Derivatives Activities*, *supra* note 222, at 20,192.

incentives of banks to perform meaningful risk assessment and analysis. Accordingly, FFIEC eliminated the high-risk tests and emphasized, using a formulation that was by this point familiar, that “an effective risk management program, through which an institution identifies, measures, monitors, and controls the risks of investment activities, provides a better framework.”²²⁵ The regulators again stressed their belief that risk management was an antidote to the increasing complexity of on- and off-balance sheet assets²²⁶ and that a risk management program must entail procedural, technical, and internal control elements.²²⁷ Though much of the 1998 policy statement could be characterized as humdrum from the perspective of the banks, the FFIEC nevertheless expressed the most comprehensive statement of risk management norms yet in U.S. banking regulation: “Effective risk management addresses risks across all types of instruments on an investment portfolio basis and *ideally, across the entire institution.*”²²⁸ This dictate widened the dimensionality, though not the number, of subjects that bank risk management departments were to monitor and control.²²⁹ “To the extent practicable,” measurements of exposures “should be aggregated and integrated with similar exposures arising from other business activities to obtain the institution’s overall risk profile.”²³⁰

The 1998 policy statement did not venture into virgin territory. We have already seen how OCC Circular 277 and FRB Supervisory Letter 93-69 required bank risk managers to consider the interconnections between risk positions and develop methods for determining institution-wide, aggregate risk profiles.²³¹ In 1996, the OCC issued guidance in an advisory letter regarding the newly developed credit derivatives, such as credit default swaps and total return swaps.²³² The 1996 credit derivatives

225. *Id.*

226. *See id.* (citing the need for a comprehensive response to the increased investment risk).

227. *Id.* at 20,194.

228. *Id.* at 20,192 (emphasis added).

229. Recall that the 1992 *Supervisory Policy Statement on Securities Activities* had already required banks to address asset-liability mismatching, asset concentration risk, liquidity risk, credit risk, market volatility risk, and operational risk. *See supra* note 168 and accompanying text.

230. *Supervisory Policy Statement on Investment Securities and End-User Derivatives Activities*, *supra* note 222 at 20,194.

231. *See supra* notes 180-181 and 184-187 and accompanying text (discussing OCC Circular 277).

232. OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC 1996-43, DESCRIPTION OF GUIDELINES FOR NATIONAL BANKS WITH RESPECT TO CREDIT DERIVATIVES (1996), *available at* <http://www.occ.gov/news-issuances/bulletins/1996/bulletin-1996-43.html>.

guidance cited the treatment of “interconnection risk” in Circular 277.²³³ However, the 1996 guidance went a step further. The Circular only required banks to “develop” aggregate, institution-wide estimates of risk, but the 1996 guidance imposed consideration of correlations and interconnections among portfolio positions as a pre-condition to transacting in credit derivatives.²³⁴ Another advisory letter, issued in 1994 to cover structured notes, expressed similarly high expectations of risk management: “The OCC considers it an unsafe and unsound practice for a bank to purchase material amounts of structured notes, or any other bank asset, *without a full appreciation of the risks involved.*”²³⁵

D. Risk Management and Capital Adequacy

This section chronicles how the nuts and bolts of the capital adequacy regime, the linchpin of modern bank regulation, gradually transformed from a relatively simple and mechanical set of supervisory formulas to the regulation of risk management. The three-stage regulatory process discussed above in sub-Part II.C addresses risk management systems as part of the examination process. By the mid-1990s, however, the Basel Committee had begun to address risk management as part of the capital adequacy regime too. Before addressing the Basel Committee’s coupling of risk management and capital regulation, however, an early industry-based endeavor merits special attention. In 1993, the Group of Thirty, a committee composed of senior bankers and their lawyers, published perhaps the ultimate expression of the traditional risk management story during this period: a consultative report entitled *Derivatives: Practice and Principles*. The report presents the industrial vision of risk management as an aspirational system of control characterized by quantitative enthusiasm and a faith in the ability of risk managers to reduce risk exposures to common variables susceptible to enterprise-wide aggregation.

The report aimed to “define a set of sound risk management practices for dealers and end-users” of derivatives.²³⁶ Despite the Group’s assertion that its efforts were to be considered separately from ongoing regulatory

233. *Id.* at 2.

234. *Id.* at 3 (“Prior to substantial participation in the market for credit derivatives, protection selling banks should thoroughly evaluate their credit portfolios, identifying credit concentrations and risk inter-connections, in order to assess how these products can best help to achieve strategic portfolio objectives.”).

235. OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC ADVISORY LETTER 94-2, PURCHASES OF STRUCTURED NOTES 4 (July 21, 1994), *available at* <http://www.occ.gov/static/news-issuances/memos-advisory-letters/pre-1995/advisory-letter-1994-2.pdf> (emphasis added).

236. PRACTICES AND PRINCIPLES, *supra* note 46 (preface).

initiatives concerning risk management, it picked up on the same themes. Included in the document were twenty-four recommendations, ranging from broad but banal incantations of senior management's oversight responsibilities to narrow discussions of specific mark-to-market valuation methods, standardized contractual provisions, and accounting rules.²³⁷ The Group of Thirty advocated for the measurement of market risk through value-at-risk approaches using probability analysis based upon a common confidence interval. J.P. Morgan staff had pioneered value-at-risk techniques shortly before the report's publication in the management of its own risk.²³⁸ The techniques estimated the maximum expected loss from an adverse market movement within a specified probability level (known as the "confidence level") over a particular time (known as the "time horizon").²³⁹ The report presaged the enterprise-wide focus that would come to dominate risk management discourse in the later part of the decade: "Reducing market risks across derivatives to a single common denominator makes aggregation, comparison, and risk control easier."²⁴⁰ Moreover, the report urged banks to quantify estimates of current and potential future losses due to credit risk despite the acknowledged difficulties with assessing the effects of potential defaults.²⁴¹ The report also recommended that banks establish dedicated business units, independent of revenue generating units, to perform the recommended measurement tasks, including most prominently the value-at-risk calculations.²⁴² The Group of Thirty's embrace of value-at-risk techniques presaged key regulatory actions in subsequent years, starting with the Basel

237. *Id.*

238. GILLIAN TETT, *FOOL'S GOLD: HOW THE BOLD DREAM OF A SMALL TRIBE AT J.P. MORGAN WAS CORRUPTED BY WALL STREET GREED AND UNLEASHED A CATASTROPHE* (2009).

239. CROUHY ET AL., *supra* note 50, at 187-88; *see also* PRACTICES AND PRINCIPLES, *supra* note 46, at 9-10. A risk management text frames value-at-risk techniques in terms of the questions they answer as follows:

[Value-at-risk] is not the answer to the simple question: *How much can I lose on my portfolio over a given time period?* The answer to this question is "everything," or almost the entire value of the portfolio! . . . Instead, [value-at-risk] offers a probability statement about the potential change in the value of a portfolio resulting from a change in market factors, over a specified period of time. [Value-at-risk] is the answer to the following question . . . : *What is the maximum loss over a given time period such that there is a low probability, say a 1 percent probability, that the actual loss over the given period will be larger?*

CROUHY ET AL., *supra* note 50, at 187.

240. PRACTICES AND PRINCIPLES, *supra* note 46, at 11.

241. *Id.* at 13-14.

242. *Id.* at 12, 15.

Committee's incorporation of internal models into capital regulation.

In 1988, the Basel Committee had published its *International Convergence of Capital Measurement and Capital Standards*, known as the "Basel Accord" or, more familiarly, as "Basel I."²⁴³ The Basel I regime, which applied to internationally active banks, represented the first multilateral coordinated system concerning the imposition of credit risk capital requirements. Basel I aimed to ensure banks possessed an adequate capital cushion to cover unanticipated losses due to credit risk—that is, the risk that borrowers or other counterparties default on their obligations. Four years later, the Basel Committee commenced work on a series of amendments to the Basel I regime that would address the burgeoning levels of market risk to which banks had become exposed due in part to their derivatives activities.²⁴⁴

A brief note on capital requirements is in order here. Regulators impose capital requirements to promote the solvency of banks. Because a rash of bank insolvencies can threaten ripple effects to the broader economy—a classic negative externality or "social bad"—public policy mandates a regulatory response, which has traditionally taken the form of government safety nets. However, the safety nets such as the explicit and implicit state guarantees in the form of deposit insurance and in extremis support from central banks, attenuate the force of ordinary market mechanisms to discipline bank management and heighten the need for a further public law intervention to minimize resort to government guarantees. This is where capital requirements come in: as a fix for a sort of corporate governance gap that otherwise biases bank managers towards excessive risk-taking. They might be conceived of as the contractual protections, analogous to covenants in private creditor loan agreements and indentures, that the government, as the ultimate risk-bearer, demands. In other words, if depositors and other creditors did not receive some sort of government guarantee, they would likely check bank risk-taking. As a mechanical matter, capital requirements are, roughly speaking, minimum net worth requirements that are calibrated to the perceived riskiness of a bank's asset profile, such that a bank holding a large proportion of risky assets, such as developing market corporate loans, will be required to maintain a greater net worth than a bank whose assets consist exclusively of government bonds. Capital requirements, then—because they consist of governmental mandates imposed as a response to the threat of negative

243. BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS (1988) (updated April 1998), available at <http://www.bis.org/publ/bcbsc111.pdf>.

244. See Weber, *supra* note 153, at 822-29 (describing the subsequent efforts of the Basel Committee).

externalities resulting from market failures—are distinguishable from purely privatized risk management.²⁴⁵ The market risk amendments, however, erased this distinction and linked public capital regulation to private risk management. Specifically, the market risk amendments, finalized in 1996, pegged banks' market risk capital requirements to the results of the value-at-risk estimations performed by the banks' own internal risk management departments.²⁴⁶

The market risk amendments themselves are intricate, but two aspects bear mention here. First, the gist of the new market risk capital requirement would require banks to maintain capital with respect to each market risk exposure in an amount sufficient to withstand the maximum loss over a ten-day period at a ninety-nine percent confidence level—the loss that the bank's risk managers, using their proprietary and historical valuation models, are, statistically speaking, ninety-nine percent sure the bank will not incur.²⁴⁷ Second, the amendments effectuated a dramatic shift in discretion away from accountable public administrators and towards private firms unaccountable to the constituencies for whom the public law intervention was necessary.

Here we see the principles set forth in the Group of Thirty report incorporated into law. Prior to the market risk amendments, banks had sought for years to persuade regulators to tie capital requirements to risk management value-at-risk models.²⁴⁸ And the Basel Committee did not stop with market risk. In 2004, the Basel Committee published a comprehensive capital regulation framework, popularly known as “Basel

245. Looked at from the perspective of bank regulators, capital requirements complement risk management systems. *See, e.g.*, FCA Interest Rate Risk Management Amendment, *supra* note 138, at 39,219 (suggesting that “new interest rate risk [management] regulations and policy statement will improve FCA oversight of the System by supplementing existing capital regulations, which specifically address only credit risk.”); *see also* Regulatory Capital: Interest Rate Risk Component: Notice of Proposed Rulemaking, 55 Fed. Reg. 53,529, 53,531 (proposed Dec. 31, 1990) (imposing an interest rate risk capital requirement while at the same time applauding the adoption of “meaningful interest rate risk management programs and hedging strategies” following “the stress of the 1979-82 period”).

246. BASEL COMM. ON BANKING SUPERVISION, AMENDMENT TO THE CAPITAL ACCORD TO INCORPORATE MARKET RISKS (1996), *available at* <http://www.bis.org/publ/bcbs24.pdf?noframes=1>. Banks technically had the option to opt for a “standardized” approach that set forth fixed, computational formulas. *See* Weber, *supra* note 153, at 822-23 (distinguishing the Basel Committee's amendment from previous regulatory efforts because it allowed regulated banks to choose the standard or internal models methods for computing capital risk charges).

247. *Id.* at 823.

248. *See, e.g.*, Regulatory Capital: Interest Rate Component, 55 Fed. Reg. 53,529 (proposed Dec. 31, 1990) (encouraging the practice of tying capital requirements to interest rates).

II,” that, among other things, allowed banks to set their *credit risk* capital requirements by reference to estimates of (i) probability of default and (ii) losses in the event of default generated internally by banks’ risk management units.²⁴⁹ Even more provocatively, the Basel II framework would permit banks to determine their capital requirements covering *operational risk* by reference to internally-generated estimates of loss.²⁵⁰ With Basel II, capital adequacy became definitively joined at the hip to risk management. In the words of the vice-chairman of the FRB at the time Roger Ferguson, Basel II was “as much a proposal for strengthening risk management as it is a proposal for improving capital standards.”²⁵¹ To Ferguson, “these considerations are, as they should be, inseparable.”²⁵²

By embracing value-at-risk and related quantitative risk estimation techniques as tools of capital regulation, the Basel Committee made two related, but distinct, assumptions that introduce the central theme of the alternative story. The first assumption was that the internal estimates by bank risk management units were reliable. We have already seen how the regulation of risk management in connection with the examination process increasingly came to embrace this view.²⁵³ The problems with this assumption have been taken up exhaustively in the literature, but certain aspects bear mention here as reflective of normative assumptions about what *risk assessment* entails.²⁵⁴ As a general background observation, the widespread unreliability of financial models by which bank capital levels were set—for both internal risk management purposes and, for those jurisdictions that had implemented the Basel II framework, for regulatory capital purposes—was a central factor in the meltdown of the financial system in 2008.²⁵⁵ Simply put, the models failed to signal credit, market,

249. See Weber, *supra* note 154, at 827-28 (describing key input parameters under the internal ratings basis models).

250. See *id.* at 828-29 (noting that Basel II required banks to include a charge against operation risk based on their own risk calculations). Operational risk was defined as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events.” BASEL II FRAMEWORK, *supra* note 55.

251. Roger W. Ferguson, Jr., Vice-Chairman, Bd. Govs. of the Fed. Res. Sys., Remarks at the ICBI Risk Management 2003 Conference, Geneva, Switzerland, (Dec. 2, 2003), available at <http://www.federalreserve.gov/boarddocs/speeches/2003/20031202/default.htm>; see also HULL, *supra* note 59, at 188 (interpreting the Basel Committee’s decision to require an operational risk capital requirement in part as a push to make banks “pay more attention to their internal systems to avoid catastrophes”).

252. Ferguson, *supra* note 252.

253. See *supra* Part II.C.

254. See Allen & Saunders, *supra* note 56, at 97 (noting that value-at-risk “is a risk measurement, not a risk management question”).

255. See James Fanto, *Anticipating the Unthinkable: The Adequacy of Risk Management in Finance and Environmental Studies*, 44 WAKE FOREST L. REV. 731, 735-46 (2009).

and liquidity risks in a manner that was effectively communicated to bank management. One pre-crisis survey of empirical work on value-at-risk models closes with the following summation: “So, in short, we ought to be able to identify most bad [value-at-risk] models, but the more worrying issue is whether we can find any good ones.”²⁵⁶ The chief technical limitations of value-at-risk models follow from their reliance on historical data:²⁵⁷ first, such reliance in the context of a value-at-risk model implicitly assumes that future losses cannot exceed past losses and second, the results of the model are highly sensitive to the look back period on which the model is based.²⁵⁸ Even when banks model time stochastically—i.e., by random computer simulations—the assumptions are deterministic and are therefore static.²⁵⁹

A more fundamental limitation follows from the nature of the question it answers. Recall that value-at-risk models determine a loss level that, statistically speaking, will not be exceeded at a specified confidence level (e.g., ninety-nine percent). But the premises of this question reflect normative assumptions about the risk assessment process. Even if risk managers construct a reliable, robust model, the model will yield the *minimum worst loss*—i.e., the upper bound of the range that the model was ninety-nine percent confident total losses would not exceed—rather than the *expected worst loss*.²⁶⁰ If the model were ninety-nine percent confident that losses would not exceed \$100 million, it *would be entirely silent* about the relative likelihood that a rare event would result in a \$110 million loss or a \$100 billion loss. Moreover, the model results are highly sensitive to the selection of the time horizon. Banks universally use a one-day time horizon to measure market risk exposure, which gauges a bank’s vulnerability to losses over the next twenty-four-hour-period. However, the Basel Committee has recently observed that “to determine the level of capital necessary to remain in business after sustaining a large loss, risk must be assessed over a longer holding period.”²⁶¹ In the Basel Committee’s defense, the Basel II framework provided for mandatory

256. Dowd, *supra* note 24, at 183, 202.

257. See Hull, *supra* note 5959 (describing how value-at-risk techniques rely on historical data to generate a probability distribution of future exposures).

258. See, e.g., Tanya Beder, *VaR: Seductive But Dangerous*, 51 FIN. ANALYSTS J. 12 (1995) (examining eight common value-at-risk methodologies and finding that the resulting exposure estimates varied by as much as fourteen times on the same portfolio).

259. See BASEL COMM. ON BANKING SUPERVISION, FUNDAMENTAL REVIEW OF THE TRADING BOOK 59 (2012) [hereinafter TRADING BOOK REVIEW], available at <http://www.bis.org/publ/bcbs219.pdf> (discussing the limitations of continuous stochastic processes in value-at-risk models).

260. See René Stulz, *Risk Management Failures: What Are They and When Do They Happen?*, 20 J. APPLIED CORP. FIN. 58, 61 (2008) (discussing the mismeasurement of risk).

261. TRADING BOOK REVIEW, *supra* note 260, at 61.

dialogues between banks and regulators concerning modeling assumptions and “backtesting” of models (i.e., comparing model predictions with actual results) with capital step-ups for banks with underperforming models.²⁶² It also imposed qualitative and quantitative prerequisites for eligibility to use internal models.²⁶³ To develop further certain of the qualitative prerequisites, the OCC published guidance in 2000 concerning model validation.²⁶⁴ These prerequisites and requirements have served to bolster the reliability of the models, but they were silent concerning key issues of how banks identify and explore threats as part of their risk assessment process.

The second assumption was that a quantitative approach to risk management should comprise the backbone of the new regulatory environment.²⁶⁵ By thoroughly mathematizing the regulatory capital system, regulators implicitly endorsed such an approach. Though regulatory guidance has from time to time addressed the need to complement quantitative, mathematical models with judgment and experience, the guidance has been vague and largely duplicative of the extant risk management regulatory guidance. Against this background, the qualitative dimension of risk management emerges as more of a conceptual placeholder than a substantive directive—a reference to an acknowledged, but ultimately unresolved, problem. Both the quantitative emphasis and the value-at-risk methodologies themselves reflect a broader problem with the *risk assessment* process that underpins the alternative story discussed below: while regulators have demanded ever greater levels of risk control, they have failed to engage sufficiently on the political-rhetorical task of threat identification and the descriptive-relational task of exploring the causal environments within which the threats operate.

262. BASEL II FRAMEWORK, *supra* note 5555, at 191-97. The regulator-bank dialogue is frustrated by the lack of a credible alternative to approval on the part of the regulator. TRADING BOOK REVIEW, *supra* note 259, at 8-9.

263. BASEL II FRAMEWORK, *supra* note 5555, at 191-97. The qualitative pre-requisites to the market risk internal models approach echo the then-existing guidance applicable generally to risk management systems, including, among other things, independence of the risk management unit, active involvement of the board and senior management, existence of risk limits tied to risk management models, internal audit functions, and adequate internal controls. *Id.* at 191-93. Certain internal model-specific pre-requisites also applied, such as the existence of a backtesting program, ongoing validation of models, the integration of the model into day-to-day risk management practices (as opposed to regulatory capital purposes), and a rigorous program of stress testing. *Id.*

264. OCC MODEL VALIDATION GUIDANCE, *supra* note 126.

265. See generally PABLO TRIANA, THE NUMBER THAT KILLED US: A STORY OF MODERN BANKING, FLAWED MATHEMATICS, AND A BIG FINANCIAL CRISIS (2012) (discussing value-at-risk and its role in financial crises).

III. THE ALTERNATIVE STORY: RISK MANAGEMENT REGULATION AS CONCEPTUAL CRUTCH

“Can we know the risks we face, now or in the future? No, we cannot; but yes, we must act as if we do.”²⁶⁶ So opens an essay with a pithy distillation of the crux of an alternative story of the history of risk management regulation. Part II presents the traditional story of risk management, according to which regulatory interventions are practical, functional responses to threats to the achievement of regulators’ statutory mandates of financial stability and institution-level safety and soundness. As further risks and vulnerabilities were discovered, the regulatory system deputized risk management departments to counteract them, providing ever more detailed guidance and imposing ever-wider expectations along the way. The alternative story, by contrast, acknowledges the empirical fact of risk management as an enhanced organizational and regulatory priority, but interrogates its normative assumptions. It presents the regulatory focus on risk management as more of a cultural crutch in response to growing anxiety about endemic uncertainty—as a reflection of the aspirations underlying the practice rather than the practice as such.²⁶⁷ It sees in risk management a placeholder delimiting the range of objects that *demand organizational control* rather than the range of objects that are in fact *susceptible to such control*. It “is a practice which must work because it is demanded.”²⁶⁸

Michael Power’s analysis of audit and risk management as cultural systems lays the groundwork for this alternative story. Power describes the late 1980s and early 1990s as the era of the “audit society”—a period in which audit systems proliferated in a wide variety of contexts.²⁶⁹ We have seen how risk management grew out of internal control logic, which itself can be thought of as a sort of permanent, systemic state of internal audit. His observations on the audit society therefore resonate with risk management too. Power adopted the term “audit society” to refer “to the tendencies revealed by these commitments rather than an objectively identifiable state of affairs.”²⁷⁰ The “official meta-accounts” of auditing refer to the aspirations of the audit, typically the prevention of fraud, but the methodological common sense practices of auditing are heterogeneous

266. MARY DOUGLAS & AARON WILDAVSKY, *RISK AND CULTURE: AN ESSAY ON THE SELECTION OF TECHNICAL AND ENVIRONMENTAL DANGERS* 1 (1982).

267. POWER, *supra* note 17, at 4.

268. *Id.* at 11 (writing of audit systems).

269. *Id. passim.*

270. *Id.* at 4.

and diverse.²⁷¹ To Power, “the idea of audit” is inherently ambiguous because “the word is not used simply descriptively to refer to particular practices, but normatively in the context of demands and aspirations for accountability and control.”²⁷² In the process, real operational capabilities diverge from the programmatic promises of the audit.²⁷³

In the regulatory context, public law authorities impose audit requirements as an adaptive response to transformations in conceptions of the administrative state, so as to secure continued legitimacy through the appearance of control. The problem of mismatched aspirations and operations is most pronounced where audited systems produce outputs that are ill-defined such as “true and fair financial statements.”²⁷⁴ Such opaque outcomes are unlike, say, a wheelbarrow’s fitness for purpose. In the case of the fitness of wheelbarrows, the effectiveness of a quality assurance program (QAP) for manufacturing processes is tightly coupled with the wheelbarrow product output. If the QAP certifies the fitness of the wheelbarrows and the manufacturer is inundated with warranty claims then the QAP will be exposed as inadequate. Where, on the other hand, outputs are not easily observed, the regulatory certification of auditable internal control systems can take on a life of its own. In extreme cases, such auditable systems “exist for the [sole] purpose of being externally verified” by a regulator that, bearing in mind the irreducible opacity of outputs, is unable to verify in a meaningful sense.²⁷⁵ Ultimately Power withholds express judgment on the effectiveness of the audit society’s control logic,²⁷⁶ but he exposes several flanks in its underlying assumptions that skeptical researchers can attack.

Given the historical and conceptual linkages between internal control and risk management, it is not surprising that following his study of the audit society, Power next turned his attention to the risk management world. Again, the inquiry is not into the body of technical practices performed by risk managers as much as into how *the idea of risk management* is implemented at the organizational level.²⁷⁷ Our ideas of

271. *Id.* at 9. “Instead of a clear conception of output, auditing is constituted by a range of procedures backed by experience and judgment.” *Id.* at 69; *see also id.* at 89 (describing the “technological base” of auditing as a “diverse and humble assemblage of routines, practices, and economic constraints”).

272. *Id.* at 6 (emphasis omitted).

273. *Id.* at 9 (referring to the divergence as the “loose coupling in the auditing field between accounts of potential and operational capability”); *id.* at 89 (referring to the “*imperfect coupling* between programmatic demands for control and the realities of operationalizing it”).

274. *Id.* at 85.

275. *Id.*

276. *Id.* at 89 (reserving final judgment for the empiricists).

277. *Id.* at 24.

what is subject to control or management affect the practices by which we control risks and change our expectations concerning the controllability of newly emergent, or newly recognized, risks. In fact, our very idea of what constitutes a risk is inevitably affected by the practices and expectations of risk management. Risk managers construct question-solving models that beget other challenges demanding the same rationalized control.²⁷⁸ New ideas about risk management are therefore “performative” inasmuch as they “establish new normative climates for decision making and determine the way specific risk objects are ‘conceptualized, identified . . . and managed.’”²⁷⁹

Power describes a transition from *risk analysis* to *risk governance* that is characterized by a corporate-managerial ideal. Whereas the risk governance challenge for risk regulators in the decades leading up to the 1990s was how to develop and select among models to “populate the content of risk knowledge,” the mid-1990s reflected a new focus on the “models of the management process within which risk analysis operates.”²⁸⁰ The shift to “managerial forms of risk governance” on the part of risk regulators is potentially defensive. By seeking to govern risk management, regulators are engaging, at least in part, in a “strategy to govern unruly perceptions and to maintain the production of legitimacy” in the face of heightened anxiety about risk.²⁸¹ Risk governance co-exists with a “logic of opportunity”²⁸² that sees risk not merely as a threat but also as an entrepreneurial opportunity. For example, the introductory paragraph of the COSO ERM framework heralds ERM’s ability to equip management not only to “effectively deal with uncertainty and associated risk[,]” but also to take advantage of “opportunity” and to “enhanc[e] the capacity to build value.”²⁸³ This logic of opportunity has a moral dimension as well, and speaks to a new organizational self, capable of self-improvement and learning, facing, and managing risk in a rationalized and systematic way.²⁸⁴

278. See PAT O’MALLEY, RISK, UNCERTAINTY, AND GOVERNMENT 2 (2004) (“Risk society theorists further argue that risk-based predictions deliver insecurity rather than security, for the more that science discovers, the more it demonstrates that life is saturated with risks.”).

279. POWER, *supra* note 4, at 28 (quoting James F. Short, Jr., *Defining, Explaining, and Managing Risks*, in ORGANIZATIONS, UNCERTAINTIES AND RISKS 39 (Lee Ben Clarke & James F. Short eds., 1992)).

280. *Id.* at 20.

281. *Id.* at 21 (emphasis added).

282. *Id.* at 23.

283. COSO ERM FRAMEWORK, *supra* note 217, at 1.

284. Of course, there is nothing new about financial institutions, or any other business enterprise, taking an entrepreneurial view of risk. To the contrary, that truism is the backbone of the capitalist economy. See, e.g., ASWATH DAMODARAN, STRATEGIC RISK TAKING: A FRAMEWORK FOR RISK MANAGEMENT 8 (2008) (“[E]xposure[] to some risk is an

Ulrich Beck described late twentieth century society as a “risk society,” by which he meant to denote a period when “unknown and unintended consequences come to be a dominant force in history and society.”²⁸⁵ The moving force behind the shift to the modern risk society consists in “the expansion of culturally produced, interdependent insecurities and dangers, and the resulting dominance of the public perception of risk as staged by the mass media.”²⁸⁶ According to this view, modernity has made substantial progress in eliminating abject poverty and hunger, but has created an array of new pervasive risks that threaten often imperceptible and latent hazards.²⁸⁷ Beck predicted that societies will increasingly struggle over the distribution of these risks the way that former societies were characterized by struggles over the distribution of goods and resources.²⁸⁸ For example, modern risk-producing technologies such as nuclear power plants are insusceptible to traditional forms of normative political deliberation and control due to their intergenerational impact.²⁸⁹ A variation on the same theme is the image of a “runaway world.”²⁹⁰

Theorists adopting this broad view have accordingly lamented the “pretence of control over the uncontrollable” and view risk management primarily as a discursive practice aimed at legitimating a new untamable risk environment by portraying it as something that can be managed, controlled, and directed.²⁹¹ The proliferation of risk management literature and practices starting in the mid-1990s²⁹² reflects less of a breakthrough in damage control and more of an “increase in social *expectations* about the decidability and management of dangers and opportunities.”²⁹³ In fact, risk

integral part of success.”). What is noteworthy, however, is the newfound confidence of institutions like banks to understand and quantify risk and apply it to decision processes in a systematized, rationalized manner.

285. ULRICH BECK, *RISK SOCIETY* 22 (Mark Ritter trans. 1992) [hereinafter BECK, *RISK SOCIETY*].

286. ULRICH BECK, *THE COSMOPOLITAN VISION* 22 (Ciarin Cronin trans. 2006) [hereinafter BECK, *THE COSMOPOLITAN VISION*].

287. See BECK, *THE COSMOPOLITAN VISION*, *supra* note 287, at 19-23; see also Morgan, *supra* note 15, at 5 (“The statistical evidence shows that Americans live longer, healthier, and wealthier lives today than they did at any time in the past. Perhaps, some economists argue, we worry more about risk today precisely because we have more to lose . . .”).

288. BECK, *RISK SOCIETY*, *supra* note 286, at 20.

289. See *id.* at 162 (discussing the environmental movement’s increased focus on “threats that sometimes will not even take their toll in the lifespan of the affected individuals, but only in the second generation of their offspring”).

290. See ANTHONY GIDDENS, *RUNAWAY WORLD: HOW GLOBALIZATION IS RESHAPING OUR LIVES* 23 (2000) (discussing the limits of parliamentary democracy exposed by globalization).

291. BECK, *THE COSMOPOLITAN VISION*, *supra* note 287, at 22.

292. POWER, *supra* note 4, at 3.

293. *Id.* at 5.

might be distinguished from uncertainty on the grounds that risks are objects of organized management and control.²⁹⁴ Risk management is then properly conceived of as the rhetorical and political practices by which risk objects achieve salience within an organization, as well as the organizational responses to threats and opportunities the risk object presents. Power describes this process as follows:

Since the mid-1990s, new categories and ideas have re-shaped discourses of risk management, giving them a more central role in organizational governance, aligning them with ideals of enterprise and subsuming more traditional forms of risk analysis. This re-organization and reconceptualization of management activity in the name of risk marks a distinctive form of administrative innovation, involving the diffusion of new process frameworks[;] the organization of new concepts of risk and its management; and the creation of new classes of organizational actors as authorized representatives of best risk practice.²⁹⁵

Thus, according to the alternative story the risk management revolution is a reflection of the anxiety resulting from the loss of control.

We have seen in Part II how regulatory interventions into internal controls and risk management made increasingly ambitious demands of bank management to monitor and control risk during the 1980s and 1990s. The traditional story sees a management-based regulatory regime in these developments. Implicit in the prominence of internal control mandates was an acknowledgement that performance-based regulation of certain difficult to monitor outputs of regulatory interest (e.g., control over bribes) was not on its own sufficient to achieve certain objectives. Similarly, command-and-control technology-based regulatory approaches were viewed skeptically on account of their failure to take into account the heterogeneity of firm-specific circumstances. The legal regime, therefore, turned organizations (and its own attention) inward rather than outward, focusing on the corporate procedures on which outcomes of regulatory interest depended. Whereas the internal control mandates applied in most cases to all companies, the regulation of risk management as such took off in the bank regulatory context. This regulatory program is characterized by the allocation of responsibility to boards and senior management to manage risks; the description of specific risks that must be monitored, controlled, and communicated throughout the enterprise; and, in its final expression, the imposition of a mandate to account for the interconnectedness of risks throughout the enterprise in a comprehensive risk management program.

294. *Id.* at 6.

295. *Id.* at 28-29.

Over time the approach evolved away from simple responsibility allocation to comprehensive, enterprise-wide risk management to take into account technological advances pioneered by banks' internal risk management departments.

The recent track record, however, belies key tenets of the traditional story and supports instead the alternative story. Despite the hands-on involvement of regulators in the promotion of norms and practices, the success of the collection of practices and techniques comprising risk management in the banking sector has been equivocal. As a 2009 OECD research paper noted, risk management is "accepted by all" though its "track record is poor[.]"²⁹⁶ These failures of risk management can be analyzed in the context of the broad assessment-and-control framework set forth above in Part I to see how the realities fell short of the promise of risk management. To review briefly, risk management describes the idea motivating practices that assess and seek to control risk and uncertainty. The assessment process has a political-rhetorical dimension that answers the question "*What objectives matter to the organization, and what threatens them?*" and a descriptive-relational dimension that answers the question "*In what ways do future contingent events affect the achievement of these objectives?*" The risk control process describes the practices and techniques by which organizations utilize the knowledge obtained from the assessment process in corporate governance to achieve control. Though the distinction between risk assessment and risk management is admittedly blurry, the central themes of the traditional story—responsibility allocation, risk description/communication, and comprehensive enterprise-wide risk management—focus on the risk control process.

To an exponent of the alternative story, the poor record of risk management regulation is not surprising. The shaping of risk management norms, particularly its control processes, by regulators is more a reflection of the pretense of control than an authentic enhancement in the functionality of the techniques and methods. As the legal-regulatory infrastructure for the corporate governance of risk control took shape, the risk assessment process remained underdeveloped. Neither practitioners nor regulators devoted adequate attention to the processes by which risks are identified and their causal environments discovered, or, in other words, to the risk assessment process.

Management researcher Anette Mikes has documented what she terms the "quantitative enthusiasm" that pervades risk management departments.²⁹⁷ In her recent field-based research at financial institutions,

296. OECD CORPORATE GOVERNANCE REPORT, *supra* note 3, at 6.

297. *Calculative Cultures*, *supra* note 127, at 35.

she identified two predominant types of “calculative cultures”: quantitative skepticism and the quantitative enthusiasm.²⁹⁸ This meticulous field research is helpful to develop the catch-all references to the “tone at the top” and “firm culture” that appear in both practitioner and academic literature.²⁹⁹ As a result of the division, the risk management profession is, according to Mikes, “at a crossroads.”³⁰⁰ Banks have also largely committed themselves to a particular calculative culture in a path dependent way, so shifting dramatically to another calculative culture will entail significant costs as the risk management function builds the requisite resources and capabilities.³⁰¹

Mikes describes adherents of quantitative enthusiasm in the following terms:

[They believe] that the increasing ability of data and rising sophistication of risk modeling render more and more risk types manageable by numbers. “Quantitative enthusiasts” aim to replace judgmental risk assessments with risk quantification. They believe that risk measures are capable of reflecting the underlying economic reality reliably enough to induce requisite economic behaviors. Adherents put a high priority on building, maintaining and improving the “robustness” and “accuracy” (i.e. the relevance and reliability) of their analytical models. They also seek to extend risk model[ing], albeit complemented with qualitative methods, [to] strategic and operational risk issues. . . . [They] strive to capture the complexity of risk decisions in the model design, including much judgment upfront, so that the output of models can be a close proxy to the underlying risk profile. In this case, risk models reduce decision uncertainty, in the sense that they minimise room for disagreement among decision makers on the validity of the model output. . . . [Because many] judgmental issues are resolved in the model[ing] design,

298. See *id.* at 35; Anette Mikes, *Chief Risk Officers at Crunch Time: Compliance Champions or Business Partners*, 2 J. RISK MGMT IN FIN. INSTITUTIONS 7 (2008) [hereinafter *CROs in Crunch Time*].

299. See, e.g., THE CONFERENCE BOARD, THE ROLE OF U.S. CORPORATE BOARDS IN ENTERPRISE RISK MANAGEMENT 23 (2006), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=941179 (“Directors repeatedly said that when it comes to risk management, tone at the top is critical.”); INST. INTERNAL AUDITORS, TONE AT THE TOP: PUTTING COSO’S THEORY INTO PRACTICE (2005); PRICEWATERHOUSECOOPERS, INVESTIGATION INTO FOREIGN EXCHANGE LOSSES AT THE NATIONAL AUSTRALIA BANK 4 (2004) (“Ultimately, the Board and the CEO must accept responsibility for the ‘tone at the top’ and the culture that exists in certain parts of [the firm]”).

300. *CROs in Crunch Time*, *supra* note 299, at 16.

301. See *id.* at 20-21 (discussing the costs involved in successfully developing both strategic advisor and strategic controller roles).

little or no disagreement surrounds the risk-adjusted performance metrics, enabling decision makers to manage risky ventures *by the numbers*³⁰²

Of particular note from the perspective of modeling is that the risk manager's effort is front-loaded: once the risk manager creates a reliable and robust model, the model is set in motion according to largely automated corporate risk management procedures such as risk limits. The risk assessment process is therefore crucial as threats need to be identified and the causal environment affecting them must be adequately addressed in the model. This point cannot be overestimated: when banks use value-at-risk modeling techniques, the perceived risk of a position, portfolio, or firm depends in large part "on whether one technicality is used instead of another when designing [the] quantitative machine."³⁰³

The quantitative skeptic, by contrast, regards risk measurements as trend indicators to be taken into account alongside "managerial discretion, experience, and judgment."³⁰⁴ Faith in modeling is not unique to the quantitative enthusiasts; the development of risk models is *at the heart of* both calculative cultures.³⁰⁵ But the quantitative skeptic is mindful of the ability to model. Compared to the enthusiast, the skeptic marshals fewer institutional resources to create the perfect model and more resources on the back end where model results are contextualized. The skeptics make extensive use of mathematical models as "learning tool[s]" in a multi-factor judgment process.³⁰⁶ Skeptics are particularly wary about the use of models in connection with operational and strategic risks.³⁰⁷

Risk managers face competing demands from a diverse array of stakeholders, including creditors, regulators, corporate executives, shareholders, and even the general public.³⁰⁸ The resulting accountability challenge highlights the political-rhetorical nature of risk assessment. Stated another way, the diversity of calculative cultures follows from the

302. *Id.* at 14-15.

303. Pablo Triana, *JPMorgan's "Whale" Makes Big Splash on Key Risk Model*, FIN. TIMES, May 29, 2012, at 20.

304. *CROs in Crunch Time*, *supra* note 298, at 15.

305. *Id.*; *Calculative Cultures*, *supra* note 127, at 7 ("Risk management tools tend to be highly analytical, data-driven techniques. These are likely to strike a different chord in different managerial cultures.").

306. *Id.* at 36.

307. *CROs in Crunch Time*, *supra* note 299, at 8.

308. See COUNTERPARTY RISK MANAGEMENT POLICY GROUP III, CONTAINING SYSTEMIC RISK: THE ROAD TO REFORM: THE REPORT OF THE CRMPG III 71 (2008) [hereinafter CRMPG III REPORT], available at <http://www.crmpolicygroup.org/docs/CRMPG-III.pdf> ("The goal of risk management is not to eliminate . . . risk, but to manage it effectively to provide the stakeholders of the institutions with long-term returns commensurate with the risk.").

political-rhetorical nature of these negotiations with various stakeholders. For example, shareholders and executives generally prefer a quantitatively enthusiastic risk management orientation.³⁰⁹ Such an approach affords executives operational ease and certainty, permitting them to conduct operations consistent with a given risk-and-return level.³¹⁰ Similarly, quantitative enthusiasm assures shareholders that corporate decisions can be made according to a shareholder value imperative by optimizing returns for a given amount of risk, as well as cutting administrative costs associated with more nuanced, layered decisional frameworks.³¹¹ But this diversity persists in part because regulatory attention has preferred to focus on ever-broader visions of controls over the risk assessment process. Thus, banks face a series of regulatory guidelines that are at once more ambitious in scope, yet increasingly distant from key issues of how risk impacts corporate and regulatory goals. Simplifying only slightly, regulators command banks to control risk but offer little guidance on what constitutes a threat requiring attention (the political-rhetorical dimension of risk assessment) and how risk management departments should develop their understanding of how the threat might materialize (the descriptive-relational dimension of risk assessment). An influential industry-funded study of risk management notes that:

[D]espite all of the complexities of risk management, the essence of risk monitoring and risk management is quite straightforward. Specifically, risk monitoring and management reduces to the basics of getting the right information, at the right time, to the right people, such that those people can make the most informed judgments possible.³¹²

Industry norms and regulatory guidance have made clear that senior management and, eventually, the board of directors are the “right people.” In so doing, those corporate actors are made accountable and responsible for risk. But what is the “right information”? Regulatory guidance has generally avoided answering this question.

It might be objected that regulators have repeatedly intervened into risk management by describing the risks that must be subject to corporate control. Indeed, risk description is one of the three overarching themes of the regulation of bank risk management described in Part II above. For

309. *Calculative Cultures*, *supra* note 127, at 3, 36.

310. See Bhimani, *supra* note 109, at 3 (“The operationalization of risk management is ultimately aided by the capacity to regard risk as amenable to calculability and economic representation.”).

311. See *id.* at 2; *Calculative Cultures*, *supra* note 127, at 1 (observing that risk management “by the numbers” is “driven by a strong shareholder value imperative”).

312. CRMPG III REPORT, *supra* note 308 at 70.

instance, the OCC handbook for examiners instructs its examiners to be mindful of eight specific categories of risk: credit, interest rate, liquidity, price, operational, compliance, strategic, and reputation. The Basel Committee has mandated specific capital charges based on risk management models applied with respect to market risk, credit risk, and operational risk. Part II describes in some detail how bank regulators have provided extensive guidance with respect to certain categories of risk. But these descriptions indicate general categories of potential exposures. It is difficult to imagine any threat not easily falling into one of those categories. While they are helpful to frame issues of risk and, perhaps more importantly, constitute a risk object for which responsibility must be allocated, they do not perform the difficult analytical work of identifying and measuring, probabilistically or otherwise, the contingent events that threaten those objectives.

As Power noted, whether risk management—or, for that matter, the regulation of risk management—achieves its purposes for a given task is an empirical question.³¹³ This article does not take up that research task, but a brief examination of some recent failures of risk management helps set out in relief the concerns that the alternative story presents with respect to risk management regulation. Recent financial history demonstrates that risk management failures are commonplace, notwithstanding the expanding canon of regulatory guidance devoted to risk management.

Some conceptual splitting is necessary here. From the perspective of a bank's board of directors and management, a risk management system will have failed if it does not perform as designed. Typically, it will not have facilitated the assumption of risks in line with the risk appetite set by the board as implemented by senior management (Type 1 failure). Provided that the board and management have established and implemented risk preferences, Type 1 failures generally will result from errors in risk control, as distinguished from risk assessment. By contrast, from the perspective of bank regulators, a risk management system will have failed if its operation compromises the public regulatory objectives of financial stability and institutional safety and soundness. Typically it will have failed to prevent an institutional or system-wide crisis (Type 2 failures). Type 2 failures can relate either to risk control or risk assessment. The set of circumstances giving rise to Type 1 failures overlaps, but is not coextensive, with the set of circumstances giving rise to Type 2 failures.³¹⁴ Consider the recent example of J.P. Morgan

313. See *supra* note 277 and accompanying text.

314. See René M. Stulz, *Risk Management Failures: What Are They and When Do They Happen?* 5 (Ohio State Univ., Fisher Coll. of Bus., Charles A. Dice Ctr. for Research in Fin. Econ., Working Paper No. 2008-03-017, 2008) (“A decision to take a known risk may turn

management authorizing a derivatives trading program, which they knew to be risky, involving a multi-part hedge of a credit derivatives index. It resulted in a multi-billion dollar loss due to a failure to foresee the effects of an unpredicted event. Such circumstances describe an obvious Type 2 failure. Bank regulators, charged with supervising institutional safety and soundness and systemic stability, would have preferred risk management systems in place to prevent such a risky trading program. But if management assumed the risk voluntarily, then the losses do not represent a Type 1 failure. Under those circumstances, the bank's risk preferences influenced the construction of its analytical model and dictated the seriousness with which top decision makers in business units (including their unit risk managers) and the firm-wide risk management unit considered possible downside scenarios. From the perspective of bank management, no risk management failure would have occurred. Instead, it is the downside case of the old adage, "You win some, you lose some." Of course, there is nothing objectionable with a bank taking an entrepreneurial approach to risk-taking, but regulators and banks naturally have different tolerances for different types of risk.

The report to shareholders that UBS prepared in the aftermath of its \$20 billion losses associated with subprime-related assets in 2007 provides illustrations of both types of failures.³¹⁵ The report cites several Type 1 failures, such as the failure to follow through with plans to hire senior risk managers in the loss-making unit and insufficient communication between UBS's research team, which had discovered deterioration in the subprime market, and relevant business units.³¹⁶ These failures violate clear guidance from bank regulators concerning adequate staffing and communication concerning risk management, and they would have provided occasion for examiners to demand changes. To the extent that regulators failed to take advantage of these opportunities (and it seems they in fact did so), the designers of regulatory policy might focus on building up on-site examination capacity and reinforcing, both to regulators and banks, the importance of these issues. In short, these issues are already addressed in extant regulatory guidance and require adjustments on the margin in regulators' emphasis and tone. To remediate the failures, regulators would do well to bear in mind the Coglianesi-Lazer model of MBR and stress the importance of planning an informational infrastructure within the firm.

out poorly even though, at the time it was made, the expectation was that taking the risk increased shareholder wealth and hence was in the best interest of the shareholder.").

315. UBS, SHAREHOLDER REPORT ON UBS'S WRITE-DOWNS 4 (2008) [hereinafter UBS SUBPRIME REPORT].

316. *See id.* at 37-39 (providing a list of decisions that contributed to UBS's risk management failures).

The Type 1 failures contrast with several Type 2 failures identified in the report. The Type 2 failures reflect shortcomings in the risk assessment process. For example, risk management at UBS modeled volatility, which is a key parameter of any financial model, for AAA-rated subprime exposures in the same manner as it did for other AAA exposures.³¹⁷ As a result, its value-at-risk model revealed a minimal exposure at a high confidence level. UBS compounded its problems by failing to examine the specific characteristics of the securities that it acquired, in particular highly structured products such as collateralized debt obligations (CDOs).³¹⁸ These CDO securities are derivatives that reference, and are sometimes collateralized by, other securities that are themselves collateralized, most often by home mortgages. The report's findings are remarkably candid: "[T]here appears not to have been sufficient discussion of or actions upon concerns surrounding Subprime as an asset class until Q3 2007"³¹⁹ "It does not appear that [the market risk management team] thoroughly investigated the CDO business model."³²⁰ Traders were permitted to retain so-called "super-senior" CDO tranches, which eventually would account for 50% of total losses at UBS, because risk managers had unwittingly assumed the market for such tranches would continually expand.³²¹ Perhaps most troublingly, the report found, "[T]here is no indication that [the market risk management team] was seeking views from other sources than [the] business [units]."³²² UBS failed to conduct any analysis of the underlying home mortgage assets. In each case, failure to probe the causal environment linking possible contingent events (i.e., rising defaults among subprime borrowers) to harms (i.e., massive write-downs that wipe out earnings and eventually impair capital) contributed to a corporate catastrophe that eventually resulted in \$50 billion in losses and a taxpayer-funded bailout.³²³ For example, by questioning the validity of AAA ratings

317. *Id.* at 20, 37.

318. UBS's CDO desk accounted for two-thirds of the losses addressed in the report. *Id.* at 7. The other largest contributors to UBS's subprime exposure were an asset management unit and mismanagement of UBS's group-wide treasury department.

319. *Id.* at 37.

320. *Id.* at 40.

321. *Id.* at 14, 40.

322. *Id.* at 40. A U.S. Government Accountability Office study of financial regulators' oversight of risk management systems at large financial institutions revealed that the problem of excessive deference to business units' view of risk also affected financial regulators. See U.S. GOV'T ACCOUNTABILITY OFFICE, FINANCIAL REGULATION: REVIEW OF REGULATORS' OVERSIGHT OF RISK MANAGEMENT SYSTEMS AT A LIMITED NUMBER OF LARGE, COMPLEX FINANCIAL INSTITUTIONS 19 (2009) [hereinafter GAO RM REPORT], available at <http://www.gao.gov/products/GAO-09-499T> ("Some regulators told us that they had relied on management representations of risk, especially in emerging areas.").

323. See Goran Mijuk, *Prescription for UBS: 'Hard Work'*, WALL ST. J., Sept. 9, 2009,

or “looking through” the CDOs to examine the FICO scores or second-lien status of the underlying mortgages, the causal connections would have been laid bare.

These Type 2 failures point to a deeper problem relating to a fundamental *failure of imagination* by bank boards and managers. When bank boards and managers decide just how much imagination to exercise when considering adverse events (or catastrophes), they are engaging the fundamental political-rhetorical question of risk assessment. An industry-funded diagnostic report on the subprime financial crisis implicitly made this point in the introductory paragraph to its risk management discussion. It noted that the “shortcomings in risk monitoring and risk management . . . reflect the fact that virtually all risk management tools are unable to model/present the most severe forms of financial shocks in a fashion that is *credible* to senior management.”³²⁴ The problem is one of capturing the attention span of management, a political endeavor if there ever was one.

As a counterfactual, imagine a gadfly at meetings of UBS’s chief risk officer and its investment bank risk and governance committee constantly urging executives and committee members to approach their analytical models more skeptically and mindfully, perhaps even to consider the possibility of a once-in-a-lifetime liquidity crunch and asset value crash. “Oh,” the gadfly would add, “also consider that the government refuses to bail us out.” Although the regulators would prefer for such deliberations to occur during the risk assessment phase, thus far they have not focused on embedding this perspective in risk management departments.³²⁵ It should not come as a surprise that a 2006 horizontal examination by the Federal Reserve Bank of New York of several large banks revealed that no banks were considering the possible effects of a severe economic downturn on the corporate group.³²⁶ Instead, risk managers were conducting isolated stress tests on particular portfolios based on single-parameter events such as housing market downturns, relying on its intuition with respect to stressed market events. It is a commonplace that banks and regulators perceive different threats because they have different institutional objectives:

at C2 (commenting on UBS’ losses and subsequent reorganization); *see also* TETT, *supra* note 238, at 243-44 (discussing the size of the broader bailout bailout).

324. CRMPG III REPORT, *supra* note 309, at 70 (emphasis added).

325. *See* Saul Hansell & Joseph B. Treaster, *The Job of Imagining the Unimaginable, and Bracing for It*, N.Y. TIMES, Oct. 20, 2001, at C2 (“But the hardest thing for many on Wall Street—as for individual investors, lenders, insurers, mailroom workers, and frequent fliers—is trying to conclude which of the dark visions raised in daily news reports is the next nightmare plausible enough to allow it to color decision-making.”).

326. *See* GAO RM REPORT, *supra* note 323, at 22-23 (noting that the stress tests focused on individual products rather than the institution as a whole and did not include “financial risks enterprise-wide”).

regulators are charged with promoting safety and soundness of individual institutions and stability throughout the financial system, whereas banks face pressure to meet expectations of shareholders, rating agencies, regulators, intra-firm business units, and creditors, which represent only a few of the more prominent stakeholders.³²⁷ This divergence affects the risk assessment process in predictable ways, as safety nets permit banks to assume super-optimal levels of risk from the perspective of the deposit insurer and the central bank, which are creditors of last resort. Recall how Part II.D explained how capital adequacy regulation should be interpreted as a set of mandatory contract-like provisions, analogous to privately negotiated debt covenants, designed to protect these creditors from loss. To the extent that the capital requirements have been made to depend on risk assessment processes conducted by bank risk management departments, the divergence emerges as a real public policy problem. Regulation has only addressed this issue obliquely, failing to confront it head on.

These microeconomic incentive-related problems with the political-rhetorical dimension of risk assessment are only part of the problem. Complexity further frustrates risk assessment along its descriptive-relational dimension. The UBS report describes how “inadequate systems” and “infrastructure limitations” resulted in an “inability to obtain a portfolio view” of certain “complex products.”³²⁸ These system failures “became even more problematic with the business growth into more complex, higher margin products.”³²⁹ UBS’s experience in this regard was hardly unique. The failures of risk modeling in the lead up to the subprime financial crisis have been documented extensively.³³⁰ The main problems are that the models underlying risk management programs, whether run by quantitative enthusiasts or skeptics, are unable to represent complex phenomena. New research by complexity scientists reveals the many ways in which financial institutions transact in markets that are authentically complex, rather than merely complicated or difficult to understand.³³¹ The complex markets in which financial institutions transact render them “susceptible to unpredictable and nonlinear phase transitions, positive feedback effects, ‘normal accidents,’ complexity catastrophes, and

327. See SERGIO FOCARDI & CAROLINE JONAS, RISK MANAGEMENT: FRAMEWORK, METHODS, AND PRACTICE 5-7 (1998) (discussing the multiple objectives of risk management in financial firms).

328. UBS SUBPRIME REPORT, *supra* note 316, at 40.

329. *Id.*

330. See, e.g., OECD CORPORATE GOVERNANCE REPORT, *supra* note 3, at 6 (highlighting incentive structures, internal controls, and technical assumptions as failures of risk modeling that contributed to the financial crisis).

331. See Weber, *supra* note 43, at 645.

conflicting constraints.”³³² This significantly complicates the descriptive-relational dimension of risk assessment. Even where a bank has a clearly defined risk appetite, it might be impossible to predict when the market equilibrium on which an analytical model is premised will give way to disequilibrating shocks. This problem is particularly acute with respect to value-at-risk models that are designed to disregard the extreme events that may emerge from market structures. Thus, those risk managers who dream of a finance theory that approximates the physical sciences are wrong to hope that “[s]uch a theory . . . would allow us to predict the future course of events starting from a set of initial data.”³³³ In reality, quantitative finance is less a science than it is a phenomenological discipline constructed on “statistical arguments that are only partially constrained by the real world.”³³⁴ The real world of finance is so complex that the consequences of hypothetical “Newton’s laws of finance” could not be evaluated meaningfully.³³⁵ Even mere complicatedness, short of authentic complexity, can result in Type 2 failures. One study found that more complicated instruments were insusceptible to consistent modeling. Specifically, a modeler would feed the same data into the model, and the model would generate two separate exposure estimates that varied by as much as thirty percent.³³⁶ These implementation issues further underscore the difficulties associated with elaborating causal risk environments. Under such circumstances, a bank’s institutional imagination in the political-rhetorical dimension of risk plays an even greater role.

CONCLUSION

This Article exposes several shortcomings of the traditional story of risk management regulation that portrays risk management as an effective antidote to instability in the financial sector. The ever-expanding pretensions of control have in many respects advanced well beyond practical capabilities. The future success of risk management regulation will depend on the extent to which bank regulators are able to shape the risk *assessment* process in ways that promote the public regulatory goals of institutional safety and soundness and systemic financial stability. This

332. *Id.* (internal citations omitted).

333. FOCARDI & JONAS, *supra* note 327, at 14.

334. JAN W. DASH, QUANTITATIVE FINANCE AND RISK MANAGEMENT: A PHYSICIST’S APPROACH 8 (2004).

335. *Id.*

336. See Christopher Marshall & Michael Siegel, *Value at Risk: Implementing a Risk Measurement Standard*, 4 J. DERIVATIVES 91, 107 (1997) (finding that implementation risk, which results from the disparity in value-at-risk estimates from the same model, is especially prevalent for complex financial instruments).

challenge will to some extent require encouraging banks to “routiniz[e], even bureaucratiz[e], the exercise of imagination”—an evocative phrase with which the 9-11 Commission charged federal law enforcement and foreign intelligence agencies to remediate organizational tendencies to resist consideration of extreme low-likelihood events.³³⁷ In formulating responses to the challenge, regulators should attempt to encourage banks to expand the frontier of the possible, looking to how so-called high-reliability organizations, such as nuclear power plants, aircraft carriers, or air traffic control systems maintain reliability in conditions of stress and volatility.³³⁸ The recent emphasis on stress testing at banks is a welcome overture in this direction that, if shepherded in the right way, could promise to bolster the effectiveness of risk management regulation.³³⁹ In the same vein, the Basel Committee announced in May 2012 that it is considering jettisoning the value-at-risk model for purposes of calculating market risk capital requirements in favor of an “expected shortfall” model that requires risk managers to populate the tails of the loss distributions.³⁴⁰

337. NAT’L COMM’N ON TERRORIST ATTACKS UPON THE U.S., THE 9/11 COMMISSION REPORT 344 (2004), *available at* <http://www.9-11commission.gov/report/911Report.pdf>.

338. *See generally* KARL E. WEICK & KATHLEEN M. SUTCLIFFE, *MANAGING THE UNEXPECTED: RESILIENT PERFORMANCE IN AN AGE OF UNCERTAINTY* (2d ed. 2007) (examining how organizations themselves perform in high risk settings).

339. *See* Weber, *supra* note 18 (manuscript on file with author) (presenting a framework to encourage the use of stress tests).

340. Trading Book Review, *supra* note 260, at 3, 20.