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Post-Crisis Reform of the Supervisory System and High Reliability Theory

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I. INTRODUCTION

Post-crisis reforms of the financial supervisory system have focused on improving the *resilience* of individual firms and promoting *containment* of problems in the event that an individual firm does fail. Both resilience and containment are hallmarks of "high reliability organizations" (HROs), a class of organizations distinguished by their ability to maintain reliable performance in dynamic operating conditions.[1] In the organizational context, resilience is about making organizations more robust to unexpected problems and stresses, and able to maintain performance across a wide range of unanticipated stressed outcomes. Containment is about isolating organizational failures so that when they occur, they do not compromise system-wide performance. In the financial institutions context, these principles aim to insulate financial firms and the financial system from the unexpected. As unexpected negative outcomes occur—for instance, interest rates spike when a highly interconnected bank acquires a large long position in long-term fixed income assets—resilience and containment work together to minimize disruptions in the financial system. They are reactive principles; rather than preventing stresses in the first place, they preserve a system's ability to function as designed in an uncertain, and potentially turbulent, future.

The post-crisis supervisory reform agenda has promoted resilience and containment, respectively, by improving capital adequacy regulation and creating a new orderly liquidation authority (known as OLA) so that nonbank financial institutions (including bank holding companies) can be speedily and predictably resolved.[2] Better capitalized institutions should be

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[1] *See* EMERY ROE & PAUL R. SCHULMAN, HIGH RELIABILITY MANAGEMENT: OPERATING ON THE EDGE 5 (2008) ("Increasingly, [reliability] means both *anticipation* and *resilience*, the ability of organizations to plan for shocks as well as to absorb and rebound from them . . . ." (emphasis added)).

[2] *See* BD. OF GOVERNORS, FED. RESERVE SYS., CONSOLIDATED SUPERVISION FRAMEWORK FOR LARGE FINANCIAL INSTITUTIONS, SUPERVISORY LETTER NO. 12-17 [hereinafter LISCC

more resilient and better able to maintain solvency over a wider range of future scenarios. Moreover, a credible resolution mechanism with jurisdiction over all systemically significant financial institutions should allow supervisors to contain the impact of an unexpected failure of an institution, no matter how large or interconnected.

While post-crisis reformers have embraced these HRO *principles of reaction*, they have been slower to promote HRO *principles of anticipation*. In particular, they have struggled to formulate a systematic approach to regulating sensitivity to operations, which is a key HRO principle of anticipation. HROs distinguish themselves not only by their ability to react to unexpected stresses, but also by their ability to anticipate and avoid future stresses in the first place, preventing them from disrupting the organization or system. They learn how to avoid crises by collecting data on the causal environment in which they operate and paying attention to weak signals of stress that are building up. A fire analogy is sometimes used in this context. Resilience is about fireproofing, and containment is about firefighting, but sensitivity to operations is about investigating who or what is causing fires to spark in the first place.[3] To the extent post-crisis reform has prioritized the principles of reaction (resilience and containment) over the principles of anticipation (sensitivity to operations), supervisors have only partially embraced HRO norms.

In the financial industry, the organizational setting in which institutions become sensitive to their operations is "risk management"—an umbrella term denoting the set of practices, employees, and organizational units responsible for producing risk-related information within the firm. Risk management's purpose is to better understand how contingent future world states might impact organizational objectives. To stick with the earlier example, risk management is the organizational setting in which

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GUIDANCE LETTER], *available at* http://www.federalreserve.gov/bankinforeg/srletters/sr1217.pdf.

[3] *See infra* notes 85–87 and accompanying text.

the bank produces information concerning threats to the bank's profitability and solvency, as well as sources of vulnerability, such as the unbalanced portfolio or the sudden interest rate hike. From a risk management perspective, the unexpected is a problem to be discovered, understood, and hopefully avoided, rather than a problem against which to build a defensive bulwark (as with resilience) or a lost cause against which to defend a broader system (as with containment).

Any effort on the part of supervisors to cultivate HRO principles of anticipation at regulated financial institutions will require deep supervisory engagement with bank risk management departments and practices—a task that supervisors have historically been hesitant to meaningfully undertake. To be sure, U.S. bank supervisors and Congress have engaged with risk management as a regulatory object for over two decades. In fact, the relationship between the bank supervisory apparatus and industry risk management units is best described as one of ubiquitous engagement, with supervisors requiring and reviewing a vast bureaucracy of risk management, articulating ever more expansive expectations of control along the way.[4] Nevertheless, the enforcement record against the largest banks for inadequate risk management systems (i.e., inadequate sensitivity to operations) is nearly a *tabula rasa*. The post-reform agenda has not moved to address this *lacuna* and, consequently, has limited its embrace of HRO principles, notwithstanding recent dramatic failures of risk management at the largest financial institutions, including J.P. Morgan Chase, Bank of America, and Citigroup. The lesson seems to be that HRO theory motivates supervisory policy only in part, and that institutional or political forces prevent a more complete embrace of reliability. Although the financial system, bolstered by the resilience and containment reforms, has so far proven itself robust to these failures, HRO theory teaches us that these reactive

[4] *See* Robert F. Weber, *An Alternative Story of the Law and Regulation of Risk Management*, 15 U. PA. J. BUS. L. 1005, 1059–73 (2013) (suggesting that the increase in regulation results from a growing need for control in the face of uncertainty).

principles, on their own, will not guarantee a private ordering resulting in reliable performance.

This Article proceeds as follows. Part II will describe the new supervisory framework applicable to the largest U.S. financial institutions, highlighting how the framework is buttressed by the twin principles of resilience and containment. In particular, the framework seeks to promote resilience through improved capital adequacy regulation and seeks to promote containment through a new resolution authority for supervisors. Part III introduces HROs. It describes the distinctive organizational characteristics of HROs that enable them to anticipate problems better than other organizations, as well as maintain consistent performance when unexpected problems do materialize. Part IV explains in greater detail the importance of the reactive principles of resilience and containment to HRO performance. Part V shifts attention to the principles of anticipation, in particular operational sensitivity, and describes how HROs distinguish themselves in their ability to anticipate the unexpected. Part VI uses HRO theory to situate the post-crisis reform efforts in the area of banking supervision. It explores why supervisors have privileged principles of reaction over principles of anticipation, ultimately suggesting that such a posture is driven more by the familiar dilemmas of regulatory capture and resource constraints than by reasoned administrative judgment. Part VII concludes.

II. CAPITAL ADEQUACY REGULATION PROMOTES RESILIENCE AND ORDERLY LIQUIDATION AUTHORITY PROMOTES CONTAINMENT

In 2012, the Board of Governors of the Federal Reserve System (the FRB) published a supervisory release heralding a "new framework for the consolidated supervision of large financial institutions."[5] The unusually concise release applies to financial institutions that are subject to the FRB's Large Institution Supervision Coordinating Committee (LISCC), an internal,

[5] *See* LISCC GUIDANCE LETTER, *supra* note 2, at 1.

informal FRB supervisory working group charged with the supervision of the institutions considered to pose the greatest systemic risk to the U.S. economy.[6] It heralded a new approach for regulating some of the largest and most complex businesses in the world economy, including banking organizations J.P. Morgan Chase, Goldman Sachs, Wells Fargo, Bank of America, and Citigroup, as well as large nonbank enterprises like MetLife, AIG, Prudential, and GE Capital.[7] In the release, the FRB announced two overarching objectives that would guide its future supervisory efforts: (1) "[e]nhancing resiliency of a firm to lower the probability of its failure or inability to serve as a financial intermediary"; and (2) "[r]educing the impact on the financial system and the broader economy in the event of a firm's failure or material weakness."[8] With respect to this latter objective, the FRB, in seeking to reduce the impact of failure, should be thought of as promoting crisis containment as a supervisory norm. The release therefore announced that resilience and containment would be the twin lodestars guiding FRB supervisory policy with respect to large institutions.

To further its resilience objective, the FRB modified the capital adequacy rules to ensure that financial institutions are better capitalized and more able to withstand unexpected stress. To further its containment objective, it focused on creating a credible mechanism by which insolvent financial institutions will be resolved—that is, undergo a (much speedier) bankruptcy-like restructuring—in a manner that limits the contagion effects of their failures on other institutions.[9]

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[6] *See id.* at 2.

[7] *See id.* at 2–3 (describing how the framework will apply to "the largest, most complex U.S. and foreign financial organizations subject to consolidated supervision by the [FRB]" (known as "LISCC firms") and all other supervised bank holding companies with consolidated assets in excess of $50 billion).

[8] *Id.* at 2.

[9] *See* David Zaring, *A Lack of Resolution*, 60 EMORY L.J. 97, 99 (2010) ("Resolution is meant to be implemented before contagion sets in and the institutions' counterparties, including customers, traders, and even competitors, also fail, either through panic (which is not the fault of the counterparties) or poor risk management (which is, but still may exacerbate a crisis)."). The new requirement that large bank holding companies and

Most of these resilience-enhancing capital modifications are embodied in the "Basel III" capital accord, agreed to by the large economy bank supervisors serving on the Basel Committee on Banking Supervision.[10] The Basel III Accord, subtitled "A Global Regulatory Framework for More Resilient Banks and Banking Systems," modifies both the quality and quantity of capital requirements. Regarding quality, Basel III requires banks to meet minimum capital ratios with common equity, the most loss-absorbent capital.[11] As for quantity, Basel III mandates higher minimum capital ratios, both by increasing the previously existing minima and also imposing new capital charges, such as the capital conservation buffer, the countercyclical buffer, and a special capital surcharge applicable to SIFIs.[12] Another noteworthy boost to the capital adequacy regulation is the new leverage ratio, a capital requirement insensitive to risk, also included in the package of Basel III reforms. Although the United States supervisors have formally imposed a leverage ratio requirement on federally regulated banks since 1986, the leverage ratio is new for other jurisdictions. U.S. policymakers also communicated the pivotal role of capital to their constituents.[13]

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designated nonbank systemically important financial institutions (SIFIs) submit so-called living wills to the FRB for approval should also be considered part of the supervisory effort to promote containment. *See* Stephen A. Lubben, *Resolution, Orderly and Otherwise: B of A in OLA*, 81 U. CIN. L. REV. 485, 486–87 (2012) ("If the FDIC were to resolve this institution under the new Orderly Liquidation Authority in Dodd-Frank, it would first have to understand the business in question. It would be aided in this process by the resolution plans—or 'living wills'—that Dodd-Frank requires such institutions to prepare and file.").

[10] *See* BASEL COMM. ON BANKING SUPERVISION, BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS (2011) [hereinafter BASEL III FRAMEWORK], *available at* http://www.bis.org/publ/bcbs189.pdf.

[11] *Id.* at 2.

[12] *Id.* at 5–7. For the definition of SIFI, see *supra* note 9.

[13] *See* Dodd-Frank Wall Street Reform and Consumer Protection Act §§ 165(a)(1)(A), 165(b)(1)(A)(i), 12 U.S.C. §§ 5365(a)(1)(A), 5365(b)(1)(A)(i) (2012) [hereinafter Dodd-Frank Act] (authorizing the FRB to impose higher capital standards for nonbank financial companies supervised by the FRB and the largest bank holding companies); *see also* David Leonhardt, *Heading Off the Next Financial Crisis*, N.Y. TIMES MAGAZINE, Mar. 25, 2010, http://www.nytimes.com/2010/03/28/magazine/28Reform-t.html (quoting then-U.S. Secretary of the Treasury Timothy Geithner as stating that "[t]he top three things to get done are capital, capital, and capital").

Although progress on these resilience-enhancing initiatives has been slow, it has also been meaningful and registerable. Aggregate common equity capital at the thirty-one large financial institutions subject to group-level supervision by the FRB increased from 5.5% of risk-weighted assets in the first quarter of 2009 to 12.5% in the fourth quarter of 2014, reflecting a total increase of more than $640 billion.[14] Jamie Dimon, C.E.O. of JPMorgan Chase & Co., the largest bank holding company by assets in the world, acknowledges that reforms to the capital adequacy regime have resulted in a better capitalized and more resilient banking sector: "Capital levels are far higher today than before the crisis and, by some measures, higher than they have ever been."[15]

As for containment and resolution, Congress created two new administrative programs. First, it vested the Federal Deposit Insurance Corporation (FDIC), which has served as the receiver for insolvent federally insured banks since the 1930s, with a new orderly liquidation authority for nonbank financial institutions.[16] Henceforth, the FDIC is empowered to act as receiver not only for banks, but for any other defaulting entity posing a systemic risk to the U.S. financial system. Second, large bank holding companies and other financial institutions designated by the Financial Stability Oversight Council (FSOC) as systemically important must submit annual "resolution plans"—referred to informally as "living wills"—to the FDIC, FSOC, and the FRB.[17] These plans must explain how such companies can be wound up in a rapid and orderly resolution in the event of material financial distress or failure.[18]

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[14] *See* BD. OF GOVERNORS, FED. RESERVE SYS., COMPREHENSIVE CAPITAL ANALYSIS AND REVIEW 2015: ASSESSMENT FRAMEWORK AND RESULTS 2, Box 1 (2015), *available at* http://www.federalreserve.gov/newsevents/press/bcreg/bcreg20150311a1.pdf.

[15] Letter from Jamie Dimon, Chair and C.E.O., JPMorgan Chase & Co., to Shareholders (Apr. 8, 2015), *available at* http://www.jpmorganchase.com/corporate/annual-report/2014/ar-solid-strategy.htm.

[16] Dodd-Frank Act §§ 201–217, 12 U.S.C. §§ 5381–5394 (2012).

[17] *See* Adam Feibelman, *Living Wills and Pre-Commitment*, 1 AM. U. BUS. L. REV. 93 (2011).

[18] Dodd-Frank Act § 165(d), 12 U.S.C. § 5365(d).

The linchpin of the containment program is the OLA, set forth in Title II of the Dodd-Frank Act. With OLA, Congress authorized the Secretary of the Treasury to order the FDIC to place a non-bank "financial company"—e.g., a bank holding company or a large, interconnected hedge fund—in receivership if it is experiencing a default (or is in danger of experiencing a default) that "would have serious adverse effects on financial stability in the United States."[19] The Treasury's OLA authority is triggered upon a recommendation of two-thirds supermajorities of both the FDIC and the FRB that the firm should be resolved.[20]

The twofold emphasis on resilience and containment—that is, on capital and resolution—is unsurprising, both as a matter of political facility and of regulatory technique. Two political reasons have explanatory force. First, these reforms respond to the two most salient regulatory failures of the 2008 financial crisis: the failure to control the explosion of bank leverage (and the concomitant erosion of bank capital) in the early- to mid-2000s,[21] and the seizing up of money markets in 2008 due to fears of contagion.[22] Better capitalized banks are more resilient to unexpected stresses, and orderly liquidation authority, if it is credible, should reduce the likelihood of contagion.[23] Second, these

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[19] *Id.* § 203(b), 12 U.S.C. § 5383(b).

[20] *See id.* § 203(a).

[21] *See* ANAT ADMATI & MARTIN HELLWIG, THE BANKERS' NEW CLOTHES: WHAT'S WRONG WITH BANKING AND WHAT TO DO ABOUT IT 4 (2013) ("Excessive borrowing by banks was identified as a major factor in the crisis of 2007–2008."); *see also id.* at 232 n.17 (citing admissions by chief executive officers of JPMorgan Chase, Bank of America, and Morgan Stanley that the banking sector was too highly leveraged leading up to the crisis).

[22] *See* ALAN S. BLINDER, AFTER THE MUSIC STOPPED: THE FINANCIAL CRISIS, THE RESPONSE, AND THE WORK AHEAD 141–42 (2013) (describing how "guilt by association" imperiled various firms in 2008).

[23] Reduced likelihood of contagion results from *ex ante* and *ex post* effects of the resolution regime. The *ex ante* effects are twofold. First, a credible resolution mechanism will allow a financial institution's counterparties to form a set of expectations for how their claims will be processed in the resolution proceeding. Counterparties will be able to better manage their exposures if they have well-formed expectations about those exposures. Second, the accompanying living will regime should require financial institutions themselves to work with their supervisors to ensure that they can be wound down in an orderly manner, perhaps requiring proactive asset divestitures or systems integration before financial distress actually occurs. The *ex post* effects are more straightforward; the

regulatory reforms are tractable, notwithstanding the shadow of regulatory capture that casts over the political economy of financial regulation.[24] They are tractable in the sense that they adjust familiar, well-established legal-regulatory frameworks: namely, the existing Basel capital adequacy regime[25] and the FDIC bank resolution scheme.[26]

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entire purpose of orderly resolution is to create a legal mechanism by which large financial institutions experiencing distress can be restructured quickly without prompting problems elsewhere in the financial system.

[24] The traditional capture thesis involves, at its most basic and intuitive level, regulatees exchanging private benefits with regulators in exchange for favorable regulation; in the process, regulation comes to favor regulatees at the expense of the public. *E.g.*, George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGM'T SCI. 3 (1971). Since then, regulatory capture theory has come to embrace softer, more psychologic and hegemonic explanations for why regulatory objectives tend to merge with industry objectives. *See* James Kwak, *Cultural Capital and the Financial Crisis*, *in* PREVENTING REGULATORY CAPTURE: SPECIAL INTEREST INFLUENCE AND HOW TO LIMIT IT 71, 72 (Daniel Carpenter & David A. Moss eds., 2014) (chronicling how the FRB, the Office of the Controller of the Currency, the Office of Thrift Supervision, the Federal Deposit Insurance Corporation, and the Securities and Exchange Commission "spent most of the past two decades fulfilling the wishes of different segments of the financial sector"); WILLEM H. BUITER, *Central Banks and Financial Crises*, *in* MAINTAINING STABILITY IN A CHANGING FINANCIAL SYSTEM: PROCEEDINGS OF THE 2008 ECONOMIC POLICY SYMPOSIUM 495, 601 (Fed. Res. Bank of Kansas City, Aug. 21–23, 2008), *available at* https://www.kansascityfed.org/~/media/files/publicat/sympos/2008/buiter031209.pdf?la=en (theorizing a form of "cognitive regulatory capture" to describe phenomenon by which regulators "internali[ze], as if by osmosis, the objectives, interests and perception of reality of the vested interest they are meant to regulate and supervise in the public interest"); IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION 80, 90 (1992) (attributing regulatory capture in part to a desire for a "smoothly running work life" and a distaste for confrontation); Robert F. Weber, *Structural Regulation as Antidote to Complexity Capture*, 49 AM. BUS. L.J. 643, 645–46 (2012) (theorizing "complexity capture" as a "soft, hegemonic [form of regulatory] capture" in the context of authentically complex regulated markets that affects "even virtuous, public-regarding regulators who are resistant to traditional capture efforts by industry").

[25] *See* BASEL III FRAMEWORK, *supra* note 10; BASEL COMM. ON BANKING SUPERVISION, ENHANCEMENTS TO THE BASEL II FRAMEWORK 25 (2009), *available at* http://www.bis.org/publ/bcbs157.pdf; BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS 144 (2006) [hereinafter BASEL II FRAMEWORK], *available at* http://www.bis.org/publ/bcbs128.pdf.

[26] *See* Richard M. Hynes & Steven D. Walt, *Why Banks Are Not Allowed in Bankruptcy*, 67 WASH. & LEE L. REV. 985, 1044–51 (2010) (discussing the FDIC bank resolution scheme). In 1991, Congress created the "prompt corrective action" (PCA) regime, which requires bank supervisors to appoint the FDIC as receiver or conservator in the event that its regulatory capital levels fall below levels established by the supervisors. Orderly liquidation authority

III. INTRODUCING HROS

Regulators did not adopt these reforms merely because they were tractable and ostensibly responsive to highly publicized supervisory failures. There are technical regulatory reasons, grounded in organizational sociology, to promote resilience and containment in financial institutions and markets. Resiliency and containment are hallmark principles of HROs. A sub-branch of organizational sociology, high reliability theory has identified clusters of organizational attributes shared by organizations that are able to maintain reliable operations in dynamic operating environments.[27] It studies organizations that "succeed under trying circumstances, performing daily a number of highly complex technical tasks in which they cannot afford to 'fail.' "[28] HROs espouse a zero rate of error and almost match it in performance.[29]

The idea of high reliability in operating environments has a long history. The catalyst for the HRO research program in the late 1980s and early 1990s was the observation that as technologies became more complex, volatile, and laden with catastrophic potential for human and environmental damage, classes of organizations seemed to meet the operational challenge.[30]

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differs from the FDIC PCA regime because the latter does not contemplate the use of supervisory discretion, instead relying on precise, rigid numerical triggers. *See* Thomas H. Jackson & David A. Skeel, Jr., *Dynamic Resolution of Large Financial Institutions*, 2 HARV. BUS. L. REV. 435, 442 (2012) (contrasting OLA with PCA on grounds that although the former vests near-complete discretion in supervisors, the latter was motivated by a desire to strip supervisors of discretion, which Congress thought they had abused in the lead-up to the savings and loan debacle of the late 1980s).

[27] *See* KARL E. WEICK & KATHLEEN M. SUTCLIFFE, MANAGING THE UNEXPECTED: RESILIENT PERFORMANCE IN AN AGE OF UNCERTAINTY 65–82 (2d ed. 2007) (discussing the "principles of containment," including a "commitment to resilience").

[28] *See* Gene I. Rochlin et al., *The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea*, 40 NAVAL WAR C. REV. 76, 76 (1987).

[29] *Id.*

[30] *Id.*

HRO theory was a direct rejoinder to normal accident theory,[31] which had predicted the opposite result: that with interactively complex systems comprised of tightly coupled components, accidents—and the unexpected—were to be expected.[32] Neither accident prevention nor accident containment could promise adequate protection against these new technologies, such as nuclear power plants. These intramural debates within organizational sociology raged against the background of what Ulrich Beck heralded as the "risk society": a new condition of modernity in which rational and universal scientific values were no longer legitimate economic and social systems, which are increasingly dominated by "new technologies balancing on the verge of catastrophe."[33] This Article elides that debate, and instead registers how HRO principles underlie supervisory reforms—and, indeed, the existing bank supervisory system—in ways that have gone unnoticed.

The HRO literature has not examined financial institutions, but has instead focused on field research of aircraft carriers, wildfire fighting, nuclear power plants, emergency rooms, air traffic control centers, water system control rooms, and electrical grid operators.[34] Financial institutions, especially those whose failure could cause a system breakdown in the financial system, share two attributes with these types of organizations. First, they are characterized by a high degree of operational stress and constantly changing

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[31] *See id.* (contrasting normal accident theory with HRO theory); *cf.* ORTWIN RENN, RISK GOVERNANCE: COPING WITH UNCERTAINTY IN A COMPLEX WORLD 29–30 (2008) (noting that HRO performance might undercut Beck's "risk society" thesis (referred to below), which, like normal accident theory, proceeded from the premise that modernity necessarily entailed exposure to heightened risks of catastrophes).

[32] *See* CHARLES PERROW, NORMAL ACCIDENTS: LIVING WITH HIGH-RISK TECHNOLOGIES 3–5 (1984).

[33] ULRICH BECK, RISK SOCIETY: TOWARDS A NEW MODERNITY 185 (Mark Ritter trans., 1986); *see also* Anthony Giddens, *Risk and Responsibility*, 62 MODERN L. REV. 1, 3 (1999) ("A risk society is a society where we increasingly live on a high technological frontier which absolutely no one completely understands and which generates a diversity of possible futures.").

[34] *See, e.g.*, Charles F. Sabel, *A Real-Time Revolution in Routines*, *in* THE FIRM AS A COLLABORATIVE COMMUNITY: RECONSTRUCTING TRUST IN THE KNOWLEDGE ECONOMY 106, 122 (Charles Heckscher & Paul S. Adler eds., 2006).

circumstances.[35] HRO personnel specialize in performing tasks such as "generating electric power through nuclear fission, launching and recovering jet aircraft rapidly from and back onto pitching, greasy flight decks, launching and recovering space shuttles, or fighting forest fires as they race through rough terrain."[36] Operating and managing organizations in these environments is challenging indeed. As for financial institutions, it borders on cliché to refer to contemporary markets as innovative, dynamic, and fast-moving. The relevance of the HRO framework to financial institution performance is obvious. Second, many of these organizations operate at the nodes of critical infrastructural networks, or are public utilities. The "costs associated with major failures [of these] technical operations are greater than the value of the lessons learned from them."[37] As a result, the public expects a zero failure rate, or close to it.[38] Again, the comparison is evident; large financial institutions play a critical infrastructural, utility-like role in the economy.[39] It is, like an electrical grid or an environment free of ambient nuclear waste, "a foundation for the operation of society."[40]

Moreover, high reliability becomes a regulatory objective in the financial supervisory context because of the central role of the government in promoting and fostering a financial system that

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[35] *See* Todd R. La Porte, *High Reliability Organizations: Unlikely, Demanding and At Risk*, 4 J. CONTINGENCIES & CRISIS MGM'T 60, 60 (1996) (describing HROs as "large-scale operating systems *already* performing at an extraordinary level of safety and productive capacity in the face of very demanding circumstances"); Gene I. Rochlin, *Defining "High Reliability" Organizations in Practice: A Taxonomic Prologue*, *in* NEW CHALLENGES TO UNDERSTANDING ORGANIZATIONS 11, 17 (Karlene H. Roberts ed., 1993) (noting that many "innately risky technologies" are operated by HROs).

[36] Sabel, *supra* note 34, at 122.

[37] Todd R. LaPorte & Paula M. Consolini, *Working in Practice but Not in Theory: Theoretical Challenges of "High-Reliability Organizations,"* 1 J. PUB. ADMIN. RES. & THEORY 19, 19 (1991).

[38] *Id.*; *see also* ROE & SCHULMAN, *supra* note 1, at 6 ("[H]igh reliability has long been the *sine qua non* not only of operational success but of organizational survival.").

[39] *See* CARMEN M. REINHART & KENNETH S. ROGOFF, THIS TIME IS DIFFERENT: EIGHT CENTURIES OF FINANCIAL FOLLY 141–72 (2009) (discussing the historic effects of banking crises on public debt, housing values, growth, and equity values).

[40] ROE & SCHULMAN, *supra* note 1, at 9.

works continuously—or, in other words, preserving the infrastructural integrity of the financial system. Where an individual institution fails, government insurance schemes make the government, directly or indirectly, contingently liable to the failed institution's creditors.[41] And where an individual institution's failure threatens the broader financial system, the central bank will be required to stabilize the system through liquidity provision. The government intervenes (in the form of supervision) with the otherwise privatized financial system to promote reliability above and beyond the level obtainable by relying on decentralized, private markets alone. This familiar story is, of course, the normative justification for the government's supervisory intervention into financial markets; it is why supervisors examine banks, require them to maintain minimum capitalization levels, and review their internal operating procedures and governance and accounting systems.[42]

From a descriptive perspective, government promotion of reliability is an example of how modern government acts as a manager and distributor of the risks that its citizens face.[43] The welfare state is redefined as the risk management state,[44] the

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[41] *See* DAVID SKEEL, THE NEW FINANCIAL DEAL: UNDERSTANDING THE DODD-FRANK AND ITS (UNINTENDED) CONSEQUENCES 120 (2011) ("Because of deposit insurance, the government (and thus taxpayers) is on the hook if a failed bank does not have enough assets to pay its depositors in full.").

[42] The "through supervision" qualification is necessary here because the government intervenes in financial markets in other ways to promote consumer protection and other goals. For example, securities regulation mandates disclosure for securities offerings and insurance regulators approve premium pricing schemes.

[43] *See* David Garland, *The Rise of Risk*, *in* RISK AND MORALITY 48, 62 (Richard V. Ericson & Aaron Doyle eds., 2003) (explaining how the "risk management state" conceives of its citizens as "risk categories"); Giddens, *supra* note 33, at 5 (referring to the "new moral climate of politics" that characterizes risk policy); Sheila Jasanoff, *Risk in Hindsight—Towards a Politics of Reflection*, *in* RISK SOCIETY AND THE CULTURE OF PRECAUTION 28, 30 (Ingo K. Richter et al. eds., 2006) [hereinafter CULTURE OF PRECAUTION] ("In the latter half of the terrifying twentieth century, risk became a major concern of governments.").

[44] *See* Garland, *supra* note 43, at 61–62 ("[T]hinking of the welfare state as a *risk-management state* shifts our attention away from conflicts over the means of production and towards conflicts over the means of security.").

"ultimate risk manager,"[45] the "risk commonwealth,"[46] or the "cost-benefit state."[47] In this case, the risks against which the state guards are threats of a breakdown in financial markets and of taxpayer losses if institutions are bailed out.

To say that the state plays a role in promoting reliability within financial institutions prompts another query: How much reliability is optimal? Reliability "is not a global characteristic of a system; it can meaningfully be determined only with reference to an identified system and particular challenges."[48] The challenge of supervisors and the political institutions that legitimate them is to achieve an optimal, or at least acceptable, level of reliability. Reliability, in turn, is intelligible only in the light of the proper function of an organization or system. So what is the function of financial institutions and systems? Modern financial systems function properly if they continue channeling funds from those with excess capital (e.g., depositors or pension funds) to those requiring capital (e.g., expanding firms or homebuyers), facilitate payments systems, and transmit monetary policy. Financial supervision is the umbrella term to describe efforts to construct and administer a regulatory regime consisting of some mix of tools (including those that promote HRO norms) that minimizes the risk of breakdown in these core utility functions of the financial system. A closer examination, however, reveals more ambiguity. Different actors in the system—for example, small business credit users, conglomerate credit users, depositors, and firm employees—value these outcomes in different ways. There is no consensus about what it means for the financial institutions or the financial system at large to operate reliably. Once we introduce heterogeneity of opinions about what constitutes reliable

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[45] DAVID A. MOSS, WHEN ALL ELSE FAILS: GOVERNMENT AS THE ULTIMATE RISK MANAGER (2002).

[46] *See* Elizabeth Fisher, *The Rise of the Risk Commonwealth and the Challenge for Administrative Law*, 2003 PUB. L. 455.

[47] CASS R. SUNSTEIN, THE COST-BENEFIT STATE: THE FUTURE OF REGULATORY PROTECTION (2002).

[48] Brad Allenby & Jonathan Fink, *Toward Inherently Secure and Resilient Societies*, 309 SCIENCE 1034, 1034 (2005).

operation, the picture is muddled somewhat, but not irremediably. We want a system that functions safely, but also provides returns on investment and human capital sufficient to justify private parties undertaking those activities. Barring a nationalization of financial intermediation, this is a problem with which policy must reckon.[49] This Article does not wade into the question concerning how much reliability is optimal, or its companion question about how much risk is acceptable.

The answer to that question depends on a political and social process of defining and negotiating a polity's risk tolerance and preferences.[50] In other words, this Article begs the question, but does so intentionally, instead advancing a more modest project of conceptualizing supervisory reforms in light of HRO theory. It proceeds on the premise that some amount of reliability is good, and proposes a taxonomy—grounded in HRO theory's emphasis on resilience, containment, and the principles of anticipation discussed immediately below—for the tools used to achieve that reliability.

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[49] A nationalization of financial intermediation would trigger its own difficult, potentially imponderable, policy quandaries concerning how credit is allocated.

[50] *See* MARY DOUGLAS & AARON WILDAVSKY, RISK AND CULTURE: AN ESSAY ON THE SELECTION OF TECHNOLOGICAL AND ENVIRONMENTAL DANGERS 8–10 (1982) (arguing in favor of a "cultural" approach to risk analysis that enquires into how levels of risk of danger come to be accepted by communities); Ian Hacking, *Risk and Dirt*, *in* RISK AND MORALITY, *supra* note 43, at 22, 22 ("The choice of risks to worry about is rarely determined by what experts assure us are the 'objective,' 'real' probabilities and disutilities of the dangers. No general theory about what determines a choice of risks can be offered, for too many contingent facts and local stories affect the choice."); Stephen R. Perry, *Risk, Harm, and Responsibility*, *in* PHILOSOPHICAL FOUNDATIONS OF TORT LAW 321, 339–45 (David G. Owen ed., 1995) (arguing that decisions concerning the allocation of risks involve moral political choices); Ortwin Renn, *The Challenge of Integrating Deliberation and Expertise: Participation and Discourse in Risk Management*, *in* RISK ANALYSIS AND SOCIETY: AN INTERDISCIPLINARY CHARACTERIZATION OF THE FIELD 289, 290 (Timothy McDaniels & Mitchell J. Small eds., 2004) (arguing that in many risk domains, regulators must combine technical assessments of risk and efficiency-based analysis with consideration of political legitimacy and social acceptance of risk).

IV. HROs REACT TO THE UNEXPECTED: THE IMPORTANCE OF RESILIENCE AND CONTAINMENT

Together, resilience and containment refer to the ability of systems to withstand change and stress. These principles allow organizations and systems to reduce undesired outcomes when unexpected events occur.[51] The technical usage of the term "resilience" originated in the engineering field, where it refers to the "intrinsic ability of an organization (system) to maintain or regain a dynamically stable state," allowing itself to continue to function after or while experiencing stress.[52] Another definition describes resilience as the "capability of a system to maintain its functions and structure in the face of internal and external change and to degrade gracefully when it must."[53] This latter definition combines the earlier formulations of resilience (ability to maintain function) with containment (ability to degrade gracefully), underscoring the links between the two concepts. In an organizational context, commentators refer to operational resilience as the ability to ensure organizational continuity and handle operational stress.[54] A resilient system is one that continues to function across a wide range of "events and circumstances that no one was aware of or could anticipate"; it protects itself against "unknown unknowns."[55]

Containment lacks the definitional pedigree of resilience, but in invoking the idea the FRB was nevertheless trotting into the conceptual terrain of high reliability theory.[56] Karl Weick and

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[51] *See* RAGHURAM G. RAJAN, FAULT LINES: HOW HIDDEN FRACTURES STILL THREATEN THE WORLD ECONOMY 176 (2010).

[52] Erik Hollnagel, *Resilience: The Challenge of the Unstable*, *in* RESILIENCE ENGINEERING: CONCEPTS AND PRECEPTS 9, 16 (Erik Hollnagel et al. eds., 2006).

[53] Allenby & Fink, *supra* note 48, at 1034.

[54] *See* CHRIS FROST ET AL., OPERATIONAL RISK AND RESILIENCE 5, 49 (2001).

[55] RAJAN, *supra* note 51, at 176.

[56] Indeed, resilience is susceptible to the charge that it has achieved "buzzword" status, underscoring the need for precision when it is invoked. *See* Arjen Boin et al., *The Rise of Resilience*, *in* DESIGNING RESILIENCE: PREPARING FOR EXTREME EVENTS 1, 1 (Louise K. Comfort et al. eds., 2010) (referring to resilience as a "fashionable buzzword" and highlighting its use in disparate contexts). The same is true of reliability. *See* ROE & SCHULMAN, *supra*

Kathleen Sutcliffe, two pioneers of HRO theory, consider resilience (along with "deference to expertise"[57]) to be a subcategory of a broader "containment principle."[58] Weick and Sutcliffe contrast the containment principle with the "anticipation principle" as two co-equal pillars of high reliability management.[59] The latter, which we will pick up on when "sensitivity to operations" is introduced below, also informs Emery Roe and Paul Schulman's treatment of HROs. They contrast anticipation with resilience, including promoting containment.[60] This treatment underscores the connectedness between resilience and containment; Weick and Sutcliffe consider resilience to be a part of containment, and Roe and Schulman consider containment to be a part of resilience. In both cases, the containment principle is defined in distinction to anticipation.

Risk theorists Ortwin Renn and Andreas Klinke consider containment to be an "instrument" to support the broader "objective" of resilience.[61] In their view, reversibility is the touchstone of containment. Risk managers take a containment approach when they take small steps so as to be able to reverse course if things do not go as planned.[62] Charles Perrow prefers

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note 1, at 5 (referring to reliability as a "worldwide watchword" encompassing different meanings).

[57] Deference to expertise means that decisions "migrate" to those organizational actors with expertise to react to unexpected circumstances. *See* Karlene H. Roberts et al., *Decision Dynamics in Two High Reliability Military Organizations*, 40 MGMT. SCI. 614, 622 (1994) ("[D]ecisions are pushed down to the lowest levels in the carriers as a result of the need for quick decision making."). Some HRO theorists question whether deference to expertise is a meaningful identifying marker. *See* Andrew Hopkins, *The Problem of Defining High Reliability Organisations* 11 (Nat'l Research Ctr. for OHS Regulation, Working Paper No. 51, 2007), *available at* http://www.safetydimensions.com.au/wp-content/uploads/2014/04/Article_Hopkins-Defining-High-Reliability-Organisations2.pdf (describing deference to expertise as "the odd man out" among HRO principles). Hopkins notes that while the "other [HRO] characteristics . . . [are] in one way or another about organisational learning," deference to expertise "is about the locus of decision making." *Id.*

[58] WEICK & SUTCLIFFE, *supra* note 27, at 42.

[59] *Id.*

[60] *See* ROE & SCHULMAN, *supra* note 1, at 5.

[61] Andreas Klinke & Ortwin Renn, *A New Approach to Risk Evaluation and Management: Risk-Based, Precaution-Based, and Discourse-Based Strategies*, 22 RISK ANALYSIS 1071, 1087 tbl.II (2002).

[62] *See id.* (noting that in the process, they "[a]void[ ] irreversibilities").

"mitigation" to containment, capturing a related idea.[63] And yet the idea behind orderly liquidation authority is a straightforward containment strategy. The idea is to create a legal mechanism by which financial institutions and their holding companies can fail "without disrupting the economy or requiring public support."[64] The notion of containment—or, to recall the FRB's formulation, impact reduction[65]—seems here to embrace systemic considerations, whereas resilience seems to apply most readily on the institutional level. That is, efforts to support resilience through capital make *institutions* more robust to the unexpected, and efforts to support containment through orderly liquidation make the *system* more robust to institutional failures, when they do, as they must (notwithstanding regulatory initiatives to boost resilience) occur. In the presently configured financial supervisory arena, it is most useful to think about capital (and resilience) as preventing financial institutional breakdowns, and resolution (and containment) as preventing financial system breakdowns.

Whatever the subtle distinctions are between resilience and containment, both are *reactive* principles. A resilient organization reacts to unexpected stresses and prevents them from escalating into crises or failures. Consider, for example, a large, international bank that loses its license to bank in Brazil, its most profitable market (which also represents a large portion of its total revenues), on account of its lead role in a rate-rigging fraud. This bank is resilient and has managed itself so as to have in place an ample capital cushion so that the unexpected loss of the Brazilian business does not cause its creditors to panic and call their loans or deposits. Consequently, its clients and customers receive reliable and uninterrupted service despite the unanticipated stress. Similarly, a contained financial system reacts to crises and failures in one component of the system (e.g., a large, interconnected bank) and prevents them from spreading to other components and degrading

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[63] Charles Perrow, *Culture, Structure, and Risk*, *in* CULTURE OF PRECAUTION, *supra* note 43, at 47, 47–48.

[64] ADMATI & HELLWIG, *supra* note 21, at 13.

[65] *See supra* note 8 and accompanying text.

the system's functionality. It aims to prevent undesired outcomes after stress causes system components to break down.[66] If the bank from the previous example were less resilient and lacked a capital buffer, its failure might nevertheless pose little risk to the financial system if its supervisors contained the failure by (1) obtaining advance familiarity (through the living will review) with how its systemically important functions operated and (2) possessing the legal authority and institutional capacity to conduct an orderly liquidation of the institution, either by temporarily extending credit to the systemically important operations or brokering a sale to a third party (or some combination of these actions).[67]

Enhanced resiliency and containment are rational reactive strategies to preserve a system's functionality when the probability and specifics of particular challenges are difficult to define and anticipate.[68] They impliedly recognize the "fallacy of predetermination": the idea that organizations can control all outcomes in anything but the most static operating environments.[69] Some events will require reaction and response, and a highly reliable organization will have the operating slack, resources, training, and culture to ensure continuous performance. By building slack into a system, the system can retain its functionality across a wider range of stressed conditions and scenarios.[70] Organizations (and, where applicable, the regulators

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[66] *See* ERIK HOLLNAGEL, BARRIERS AND ACCIDENT PREVENTION 7 fig.1.1 (2004) (explaining how the prevention of unexpected events or outcomes results in accident avoidance).

[67] *See supra* notes 9, 23 and accompanying text (discussing how living wills and orderly liquidation authority are motivated by the principle of containment).

[68] Allenby & Fink, *supra* note 48, at 1034; *see also* RENN, *supra* note 31, at 187 (noting that risk managers, when faced with a high degree of uncertainty, "have to rely upon resilience as the guiding principle for action").

[69] HENRY MINTZBERG, THE RISE AND FALL OF STRATEGIC PLANNING: RECONCEIVING ROLES FOR PLANNING, PLANS, PLANNERS 227–28 (1994); *cf.* LEE CLARKE, MISSION IMPROBABLE: USING FANTASY DOCUMENTS TO TAME DISASTER 4 (1999) ("[U]nder conditions of high uncertainty the promise and apparatus of rational planning itself becomes mainly *rhetorical*, becomes a means by which plans—independently of their functional relevance to the task—can be justified as reasonable promises that exigencies can be controlled.").

[70] *See* Paul R. Schulman, *The Negotiated Order of Organizational Reliability*, 25 ADMIN. & SOC'Y 353, 353 (1993) (referring to organizational slack as a "critical . . . managerial resource"); WEICK & SUTCLIFFE, *supra* note 27, at 81 ("Resource slack is treated as an asset rather than a

that supervise them) can react more quickly and effectively to limit the disruptive impact of unexpected events.

V. HROs AVOID PROBLEMS BEFORE THEY OCCUR: THE IMPORTANCE OF ANTICIPATING THE UNEXPECTED

Reliability does not depend on reactive principles of resilience and containment alone. A reliable organization is able to *anticipate* equally as well as it *reacts*. How can financial institutions better anticipate, predict, define, and understand the challenges they face, and how do those efforts affect the way we think about resilience and containment as regulatory tools? From the perspective of HRO theory, these questions mark a transition from the principles of reaction (resilience and containment) to the principles of anticipation. Weick and Sutcliffe identify three principles of anticipation: (1) preoccupation with failure, (2) reluctance to simplify, and (3) sensitivity to operations.[71] When organizations are preoccupied with failure, they are more likely to notice weak signals of stress and counteract well-known decisional pathologies such as the overconfidence bias.[72] When organizations are reluctant to simplify, they problematize unexpected events and investigate anomalies, in the process minimizing the natural tendency to lose track of important details in the inevitable "subsumption of heterogeneous particulars under generic categories."[73] In so doing, they counteract other decisional pathologies, such as the disqualification heuristic.[74] Where organizations become sensitive to their operating environment, they maintain an awareness of

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liability."). In the supervisory context, capital requirements are what Schulman refers to as "resource slack," and the orderly liquidation authority is what Schulman refers to as "control slack." Schulman, *supra*, at 353–54.

[71] WEICK & SUTCLIFFE, *supra* note 27, at 45, 53, 58.

[72] *Id.* at 53.

[73] *Id.* at 54; *see also* HARIDIMOS TSOUKAS, COMPLEX KNOWLEDGE: STUDIES IN ORGANIZATIONAL EPISTEMOLOGY 124 (2005) ("[F]ormal organization necessarily involves abstraction.").

[74] *See* DIANE VAUGHAN, THE CHALLENGER LAUNCH DECISION: RISKY TECHNOLOGY, CULTURE, AND DEVIANCE AT NASA 273–74 (1996); Lee Clarke, *The Disqualification Heuristic: When Do Organizations Misperceive Risk?*, 5 RES. SOC. PROBLEMS & PUB. POL'Y 289 (1993).

actual circumstances and resist the temptation to assume that facts follow designs and expectations.[75] When applied, these principles help an organization to better understand how the environment in which it operates could cause failure. They permit the organization to anticipate and possibly avoid stress, thereby restricting the range of contingent future world states where resilience and containment are necessary to avoid failure and collapse.

I want to focus in this Article on sensitivity to operations. In doing so, I do not mean to suggest the other two HRO principles of anticipation—reluctance to simplify and preoccupation with failure—are less important. Some brief remarks on these other principles of anticipation will help to contextualize a more fulsome discussion of sensitivity to operations. Reluctance to simplify and preoccupation with failure are best operationalized in a firm's stress testing practices, which themselves form part of a wider risk management function.[76] I have argued elsewhere in favor of a "deliberation-oriented" approach to stress testing, co-produced by financial institutions and supervisors, that aims to make institutions and their supervisors more preoccupied with the possibility of failure and less reluctant to accept simple explanations of operational anomalies.[77] As currently implemented, however, stress testing regulation is designed less to promote HRO principles of anticipation and more as an adjunct component of capital adequacy regulation (i.e., a tool motivated by resilience). It is not oriented towards deliberation, but rather towards compliance with the capital rules and audit norms. Section 165(i) of the Dodd-Frank Act requires the FRB to administer annual stress tests of large banks to determine whether they have the capital "necessary to absorb losses as a result of adverse economic conditions."[78] The legislation also

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[75] *See* WEICK & SUTCLIFFE, *supra* note 27, at 59 ("When we say HROs are sensitive to operations, we mean that they are responsive to the messy reality inside most systems.").

[76] *See* Robert Weber, *A Theory of Deliberation-Oriented Stress Testing Regulation*, 98 MINN. L. REV. 2236, 2250–58 (2014) (explaining how stress testing is a "key component of existing risk management systems").

[77] *See generally id.*

[78] Dodd-Frank Act, *supra* note 13, § 165(i) (codified at 12 U.S.C. § 5365(i)).

requires that banks conduct their own semiannual stress tests on their balance sheets and share those results with the FRB.

The FRB has grafted an additional regulatory program, the Comprehensive Capital Analysis and Review (CCAR), onto the Dodd-Frank stress testing regime. Under that program, banks must, among other things, submit their proposed capital distributions to the FRB for approval. If, after giving effect to any such distributions, a bank's capital levels would fall below regulatory minimums—importantly, not only under present circumstances but also under the stress scenarios contemplated by the stress tests—then the supervisors will enjoin the distribution.[79] The capital adequacy rules are the triggers for enjoining the distribution, and capital adequacy more generally is the normative justification for the regulatory intervention. In other words, the FRB's aims, while at first blush resonating with the principles of anticipation, bend back in the direction of the reactive principle of resilience. The current emphasis of stress testing (and its regulation) on capital compliance is not necessarily fixed, and in the future stress testing should be conceived of as a tool to foster deliberation, in the process contributing meaningfully to the embedment of HRO anticipation norms.

Although stress testing is the easiest operational setting within which a firm might develop reluctance to simplify and preoccupation with failure, organizations could also seek to embed these principles into risk management more generally.[80] Anette Mikes' field research on risk management departments sheds further light on how financial institutions might, with or without prodding from regulators, cultivate an organizational reluctance to simplify and even a preoccupation with failure.[81] In any event,

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[79] *See* Robert F. Weber, *The Comprehensive Capital Analysis and Review and the New Contingency of Bank Dividends*, 46 SETON HALL L. REV. 43, 91–108 (2015) (explaining details of the CCAR program and Dodd-Frank Act stress tests).

[80] *See supra* note 71 and accompanying text (introducing reluctance to simplify, preoccupation with failure, and sensitivity to operations as the three HRO "principles of anticipation").

[81] *See* Anette Mikes, *Risk Management and Calculative Cultures*, 20 MGMT. ACCT. RES. 18, 22 (2009) [hereinafter Mikes, *Calculative Cultures*] (describing the "calculative culture" that

this Article's focus on sensitivity to operations is not intended to divert attention away from the other principles of anticipation; these principles, although analytically distinct, are interrelated and, at times, interdependent. In fact, sensitivity to operations is a precondition to an organization's preoccupation with failure and reluctance to simplify. Only through a particularized familiarity with everyday operational details can an organization—especially one operating in complex and opaque causal environments like derivatives, securities, and funding markets—are those other principles intelligible.

Organizations that are sensitive to their operating environment learn how to avoid crisis, collecting data on and being mindful of weak signals of stress and failure that are building up in the operating environment. They cultivate internal informational systems capable not only of learning from failures, but also identifying and analyzing near failures.[82] As a principle of anticipation, sensitivity to operations applies at an earlier stage than resilience and containment, seeking to prevent unexpected stresses from occurring in the first place. Institutions with operational sensitivity can shrink the range of the unexpected because they better understand the causal environment within which they operate. They learn to anticipate problems through vigilant observation. Renn notes that risks that rank high in complexity—such as the risks that impact financial stability—"require more systematic expertise and a deliberative effort to bring different epistemic communities together for *producing the*

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influences decisionmaking); Anette Mikes, *Chief Risk Officers at Crunch Time: Compliance Champions or Business Partners*, 2 J. RISK MGMT. FIN. INSTS. 7, 8 (2008) (examining how senior risk officers balance their dual roles of "compliance champion" and "business partner"). Mikes individuates two divergent "calculative cultures" in banks' risk management departments. She labels one "quantitative skepticism" and the other "quantitative enthusiasm." Mikes, *Calculative Cultures*, *supra*, at 22. The institutions with risk managers who are more quantitatively skeptical are best positioned to institutionalize HRO norms. *See* Weber, *supra* note 76, at 2312.

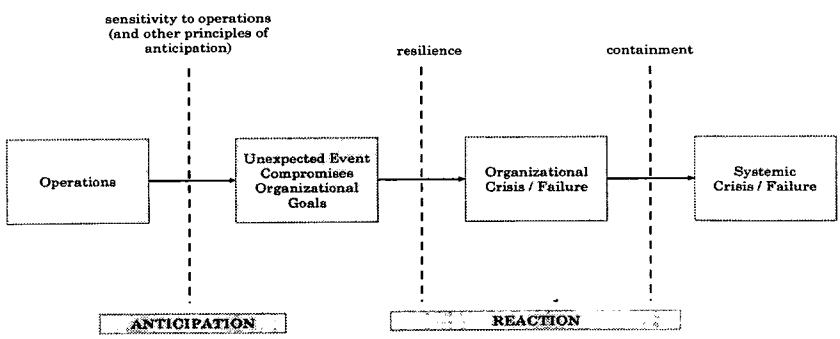
[82] *See* Sabel, *supra* note 34, at 122 (lauding HROs for engaging in "near-miss reporting," a practice that triggers "root-cause analysis meant not only to uncover the proximate cause of the incident, but to eliminate, through redesign of the organization if necessary, the background conditions which generated the immediate source of danger").

most accurate picture of the complex relationships" that affect outcomes.[83] Thinking about sensitivity to operations from a regulatory perspective, the technical project requires investigating how regulators can encourage regulated institutions to produce such an accurate picture of their operational environments.

Within financial institutions, the institutional settings where organizations can achieve sensitivity to operations are referred to as *risk management* functions or departments.[84] Dedicated risk management organizational sub-units (sometimes referred to as "functions") are responsible for producing and communicating information about risk within financial institutions. The information generated by risk managers can be used to enhance reliable performance.

The graphics appearing below illustrate how HRO principles work. Figure 1 illustrates the entry points for HRO principles as an unexpected operational stress occurs, catalyzes an institutional failure, and ramifies into a full-blown systemic crisis.

Figure 1

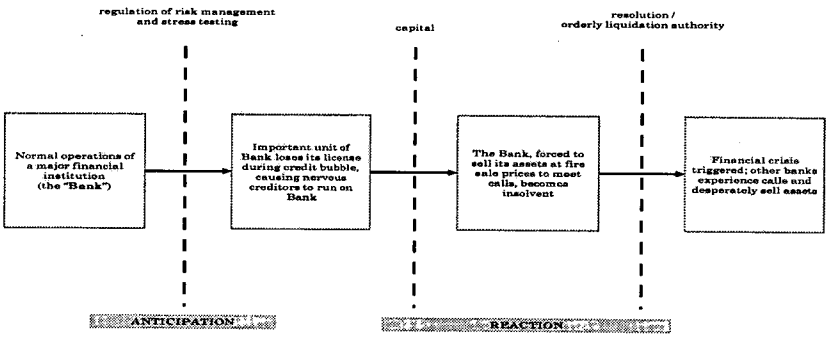


[83] RENN, *supra* note 31, at 186 (emphasis added).

[84] *See* Weber, *supra* note 4, at 1015–58 (discussing the foundational role of risk management personnel in contemporary financial institutions).

Figure 2 is a hypothetical illustration of how, in practice, supervisory policies designed to promote HRO principles might interrupt the sequential development of an unexpected adverse event at the institutional level from precipitating an institutional failure or a full-blown financial crisis.

Figure 2



VI. SOME REFLECTIONS ON HOW HRO THEORY FRAMES THE POST-CRISIS SUPERVISORY SYSTEM

Fire prevention is a familiar policy problem that illustrates how the HRO principles of resilience, containment, and sensitivity to operations work in the financial supervision context. In a 2008 speech, then President of the Federal Reserve Bank of Kansas City (and now the vice-chair of the FDIC) Thomas Hoenig compared a financial crisis to a fire in a home or business.[85] He noted that fire prevention efforts occur at two stages: first, a community seeks to

[85] Thomas M. Hoenig, President, Fed. Reserve Bank of Kan. City, Perspectives on the Recent Financial Turmoil, Remarks at the 2008 Institute of International Finance Membership Meeting 7–8 (Mar. 5, 2008), *available at* https://www.kansascityfed.org/~/media/files/publicat/speechbio/hoenigpdf/hoenigbrazil3708.pdf.

engage in *fireproofing*[86] through building codes requiring sprinklers, fire doors, and flame-retardant materials, as well as fire inspectors to make sure the rules are being followed; and second, a community employs a fire department to engage in *firefighting*, putting out fires when they do occur, and stopping them from spreading to the wider community.[87] Hoenig analogized fireproofing through enforced fire codes to capital regulation, and firefighting to emergency liquidity assistance from central banks.[88] Viewed through an HRO theory lens, fireproofing fosters resilience, and firefighting fosters containment.

Hoenig compared liquidity assistance to firefighting, but he might have extended the firefighting analogy to include orderly liquidation too. Liquidity shortages and insolvencies of large institutions share a common problem: they can cause panics. When institutions are fundamentally solvent and are experiencing a liquidity crisis, the central bank can step in as a lender of last resort and shore up confidence in the institutions experiencing liquidity shortages, avoiding a massive withdrawal of funds and an accompanying fire sale of assets as institutions struggle to return funds to withdrawing investors.[89] In the financial crisis of 2008–2009, the FRB and the FDIC injected liquidity into markets for precisely this reason.[90] According to Bagehot's dictum,[91] which has long influenced central bankers during liquidity crises (including the Bernanke-led FRB in 2008 and 2009), a central bank should

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[86] Technically, Hoenig referred to "fire prevention" rather than "fireproofing," but the term "fire prevention" comprehends a broader set of practices (including those that promote greater operational sensitivity) than those Hoenig focuses on in his remarks, which are more appropriately thought of as "fireproofing" measures. *See id.*

[87] *Id.*

[88] *Id.* at 8.

[89] *See* BEN S. BERNANKE, *Origins and Mission of the Federal Reserve*, *in* THE FEDERAL RESERVE AND THE FINANCIAL CRISIS: LECTURES BY BEN S. BERNANKE 1, 7–8 (2013).

[90] Paul Tucker, Deputy Governor, Fin. Stability, Bank of Eng., The Repertoire of Official Sector Interventions in the Financial System—Last Resort Lending, Market Making, and Capital, Remarks at the Bank of Japan 2009 International Conference 3–4 (May 2009), *available at* http://www.bis.org/review/r090608c.pdf.

[91] Financial journalist Walter Bagehot wrote the influential *Lombard Street: A Description of the Money Market*, which has continued to be influential today. WALTER BAGEHOT, LOMBARD STREET: A DESCRIPTION OF THE MONEY MARKET (1873).

only lend against good collateral, and only at penalty rates.[92] When an institution is insolvent, however, it has no good collateral.[93] Lending such an institution further funds will not quell concerns that the institution will be unable to repay its debts, and the triple threats of panic, funds withdrawal, and fire sales will persist for the institution, notwithstanding the central bank's liquidity support elsewhere in the system. Here, the policy concern becomes that investors in a large, interconnected, but insolvent, institution come to fear that their claims will not be paid. This fear, in turn, can—if the institution is large enough or the institutions to which it owes unpayable claims are themselves vulnerable—deepen a liquidity crisis and precipitate asset fire sales. All that is to say that orderly liquidation of insolvent institutions is a critical part of the metaphorical firefighting effort.[94] Emergency liquidity provision and orderly liquidation work towards the same goal, but only the latter is a supervisory activity, hence this Article's focus on OLA rather than emergency liquidity.

Hoenig proceeded, in the remainder of his remarks, to argue for increased emphasis on fireproofing and decreased reliance on firefighting. He clarified that the most promising fireproofing tool was increased capital.[95] In making that case, he echoed then-Secretary of the U.S. Treasury Department Tim Geithner, who

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[92] *See* Tucker, *supra* note 90, at 7.

[93] Brian F. Madigan, Dir., Div. of Monetary Affairs, Bagehot's Dictum in Practice: Formulating and Implementing Policies to Combat the Financial Crisis, Speech at the Federal Reserve Bank of Kansas City's Annual Economic Symposium (Aug. 21, 2009), *available at* http://www.federalreserve.gov/newsevents/speech/madigan20090821a.htm.

[94] FRB Governor Daniel Tarullo has referred to the "Hobson's choice of bailout or disorderly bankruptcy" that prevailed under the law before the FDIC possessed orderly liquidation authority, underscoring the linkages between bailout (via general liquidity provision or liquidity support to individual institutions) and resolution. *See* Daniel K. Tarullo, Governor, Bd. of Governors, Fed. Reserve Sys., Financial Regulatory Reform, Remarks at the U.S. Monetary Policy Forum 7 (Feb. 26, 2010), *available at* http://www.federalreserve.gov/newseve nts/speech/tarullo20100226a.pdf. The idea motivating orderly liquidation authority is that once supervisors have the statutory authority to resolve non-bank institutions, they will no longer face the Hobson's choice. If orderly liquidation authority proves successful (and there are as many skeptics as there are supporters), resolutions will no longer need to be "disorderly."

[95] Hoenig, *supra* note 85, at 7–8.

famously remarked during the crisis that, from a financial reform standpoint, "[t]he top three things to get done are capital, capital, and capital."[96] Indeed, supervisors have taken up his charge—partially, at least—by increasing existing capital requirements and supplementing them with additional capital requirements.[97] They have, in other words, focused on improving institutional resilience. But they have also, with Congressional authorization, expanded their firefighting/containment capabilities through review of living wills,[98] capital plans,[99] and the new OLA. The FRB has doubled down on both fireproofing and firefighting.

If resilience is about fireproofing, and containment is about firefighting, then sensitivity to operations is about investigating who or what is starting the fires in the first place. Is arson to blame for a particular fire? Is there a manufacturing defect in an electrical switch? Did a human error cause the fire? For example, did a home occupant leave the gas on, or did an employee fail to follow protocol for switching off a piece of equipment? Is a rash of fires attributable to new building components that are combustible in ways unforeseen by the manufacturer? Do the fires spread because of drought conditions or the placement of combustible materials in high-risk areas? Asking these questions contributes to the understanding of the causal environment in which fires start and spread. The answers to these questions will redound to the benefit of actors interested in avoiding fires: property owners, tenants, contractors, manufacturers, fire departments, insurance companies, police departments, neighbors, and municipal governments. Building codes, industry standards, insurance coverages, lease terms, and the like will change operational environments surrounding the activities that cause fires. Furthermore, these

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[96] Leonhardt, *supra* note 13.

[97] *See supra* note 10 and accompanying text (discussing the Basel III reforms).

[98] *See supra* note 17 and accompanying text (introducing how supervisors require and review banks' living wills, or resolution plans).

[99] *See* Weber, *supra* note 79, at 91–101 (explaining how supervisors have introduced a new CCAR program, which entails banks submitting plans concerning how they will ensure adequate capitalization over wide range of scenarios and a subsequent supervisory review of the plan, as an ongoing feature of U.S. bank supervisory practice).

queries will also generate data that will inform how these actors can promote resilience and containment norms.

Hoenig's remarks omitted any mention of this sort of anticipatory learning and inquiry into who or what is starting fires, except to register his skepticism that "it is very difficult for bank supervisors to convince bankers to heed warnings that they need to behave differently."[100] As such, the remarks impliedly suggested that crisis prevention should not depend on fostering and cultivating risk management norms, internal controls, and operational sensitivity.[101] Hoenig's perspective has prevailed in the post-crisis supervisory reform agenda, which has privileged resilience and containment over sensitivity to operations. After all, Hoenig noted, even if supervisors work with banks to expose sources of vulnerability and construct a more mindful risk management infrastructure, supervisors will struggle to change organizational practices. Indeed, he even suggested that supervisors lack the legal authority to require banks to change their operating procedures.[102] On this latter point he is incorrect. Bank supervisors have wide discretionary enforcement authority, but his statement reflects the historical disinclination on the part of supervisors to exercise this authority to influence bank business and risk management norms, particularly with respect to large banking institutions.[103] U.S. bank supervisors have been authorized since 1966 to issue cease-and-desist orders to banks engaging in "unsafe or unsound practice[s]."[104] In determining whether such practices are ongoing, they are afforded wide discretion and can consider potential and conjectural losses in addition to actual losses.[105] Though the

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[100] Hoenig, *supra* note 85, at 8.

[101] *See id.* ("As to whether increased supervision can be relied upon to prevent financial fires, I have some doubts based on my years in an examination and supervisory capacity.").

[102] *See id.* ("[T]here may be no legal basis for requiring a change in business or lending practices.").

[103] *See* Weber, *supra* note 79, at 77–78.

[104] Financial Institutions Supervisory Act of 1966, Pub. L. No. 89-695, § 101, 80 Stat. 1028, 1029 (1966) (codified as amended at 12 U.S.C. § 1818 (2012)).

[105] *See, e.g.*, Landry v. F.D.I.C., 204 F.3d 1125, 1128 (D.C. Cir. 2000) (noting that the FDIC has "a variety of weapons" at its disposal).

authority is expansive, it is almost never deployed. None of the largest U.S. banks were subject to formal enforcement proceedings "predicated on an unsafe or unsound practice finding in the five years leading up to the September 2008 financial crisis."[106] There are no data on the use of informal enforcement tools—such as entering into memoranda of understanding with the bank,[107] requiring the bank to execute board resolutions to address problems,[108] or extracting a "commitment letter" from bank management[109]—to influence institutional practices and culture.[110] But Hoenig's skepticism for the ability of the examination process to *anticipate* losses resulting from unsafe and unsound bank practices at large banks, as well as his stated preference for the *reactive* principle of resilience (fireproofing), suggests that informal enforcement activity is minimal as well.

Against the backdrop of this tepid attitude towards enforcement, a regulatory curiosity emerges. Bank supervisors actually do engage frequently with bank risk management departments, in the process evaluating the adequacy of how they become sensitive to operations. Indeed, former Chair of the FRB Ben Bernanke has referred to these discussions between supervisors and risk managers as the "heart" of the modern bank examination.[111] For example, consider how the supervisory

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[106] *See* Weber, *supra* note 79, at 100.

[107] *See* BD. OF GOVERNORS, FED. RESERVE SYS., COMMERCIAL BANK EXAMINATION MANUAL § 5020.1 (2012), *available at* http://www.federalreserve.gov/boarddocs/supmanual/cbem/cbem.pdf (positing that memoranda of understanding could be an effective way for banks to ensure Reserve Bank officials and a bank's board of directors are both aware of all problem areas that need attention).

[108] The FRB frequently uses board resolutions as an informal supervisory mechanism. In subsequent examinations, supervisors assess whether the bank has implemented the board resolutions. *See id.* § 6000.1.

[109] *See* OFFICE OF THE COMPTROLLER OF THE CURRENCY, POLICIES AND PROCEDURES MANUAL NO. 5310-3, at 4 (2011), *available at* http://www.occ.gov/static/publications/ppm-5310-3.pdf (discussing the use of commitment letters in informal enforcement actions).

[110] The bank examination process is shrouded with secrecy, and most information about communications between examiners and bank personnel are confidential under applicable agency regulations. *See, e.g.*, 12 C.F.R. §§ 4.32(b), 4.36(b) (2014).

[111] Ben S. Bernanke, Chair, Bd. of Governors, Fed. Reserve Sys., Modern Risk Management and Banking Supervision, Remarks at the Stonier Graduate School of

agencies are engaged with "operational risk," a wide-ranging risk category. The Office of the Comptroller of the Currency (OCC), the supervisor for national banks, makes operational risk one of its areas of supervisory focus.[112] The FRB, the OCC, and the FDIC all require the largest banks[113] to implement an "operational risk data and assessment system" to assist the bank in "identifying the level and trend of operational risk, determining the effectiveness of operational risk management and control efforts, highlighting opportunities to better mitigate operational risk, and assessing operational risk on a forward-looking basis."[114] Moreover, these large banks must have in place an "operational risk quantification system" that "generates estimates of its operational risk exposure using its operational risk data and assessment systems."[115] These systems are subject to supervisory review.

While the mere descriptions of the required systems on their own appear to require a deep engagement by supervisors with operational risk, a brief explanation of how operational risk is defined in the banking context underscores the sweeping, perhaps aspirational, demands on supervisors to regulate risk management. The Basel Committee on Banking Supervision has defined operational risk as "the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events."[116] An influential trade report provides an equally broad formulation, defining it as "the risk of losses occurring as a

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Banking, Washington, D.C. (June 12, 2006), *available at* http://www.federalreserve.gov/newsevents/speech/bernanke20060612a.htm.

[112] *See* OFFICE OF THE COMPTROLLER OF THE CURRENCY, SEMIANNUAL RISK PERSPECTIVE: FROM THE NATIONAL RISK COMMITTEE 10 (2015), *available at* http://www.occ.gov/publications/publications-by-type/other-publications-reports/semiannual-risk-perspective/semiannual-risk-perspective-spring-2015.pdf.

[113] This requirement applies only to institutions subject to the so-called "advanced approaches" capital adequacy rules, a group that includes banks with consolidated total assets (excluding assets held by an insurance underwriting subsidiary of a bank holding company) of $250 billion or more or with consolidated total on-balance-sheet foreign exposure of $10 billion or more. *See* Risk-Based Capital Standards: Advanced Capital Adequacy Framework—Basel II, 72 Fed. Reg. 69,288, 69,290 (Dec. 7, 2007).

[114] *Id.* at 69,315–17.

[115] *Id.* at 69,317.

[116] BASEL II FRAMEWORK, *supra* note 25, at 144.

result of inadequate systems and control, human error, or management failure."[117] A quick parse of these definitions reveals their extraordinary ambition: to manage operational risk is to manage the risk of loss from human errors, failures of management, inadequate corporate processes and systems—indeed, from all "external events," a category so broad as to include any risk of loss imaginable.[118] To summarize, bank supervisors are instructed to review and seek to influence how a bank imagines, identifies, assesses, and calculates the probability of, virtually all risks of loss.

Supervisory rating systems are another regulatory setting in which supervisors are engaged with risk management and sensitivity to operations. Supervisors allocate their limited examination resources according to rating systems that score key aspects of a bank's governance, management, and practices. At the operating company level, that system is formally referred to as the Uniform Financial Institutions Ratings System (UFIRS), but its informal sobriquet CAMELS is more widely used and more reflective of what the system measures: capital adequacy, asset quality, management capability, earnings quality, liquidity adequacy, and sensitivity to market risk.[119] As of 1996, the bank supervisory agencies instruct their examiners to afford "increasing emphasis on the quality of risk management practices in each of the rating components, particularly in the Management component."[120] The FRB, which supervises bank holding companies (as opposed to operating companies), has its own rating system, RFI/C(D), which requires a standalone assessment of risk management.[121] While the

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[117] GLOBAL DERIVATIVES STUDY GROUP, GROUP OF THIRTY, DERIVATIVES: PRACTICES AND PRINCIPLES 50 (1993).

[118] *See* IAIN WILKINSON, RISK, VULNERABILITY, AND EVERYDAY LIFE 24 (2009) (referring to the "ways in which . . . commercial organizations . . . in response to the incursion of new regulatory regimes upon their activities . . . are made to manage an ever expanding portfolio of institutional risk").

[119] Uniform Financial Institutions Rating System, 61 Fed. Reg. 67,021, 67,022 (Dec. 19, 1996).

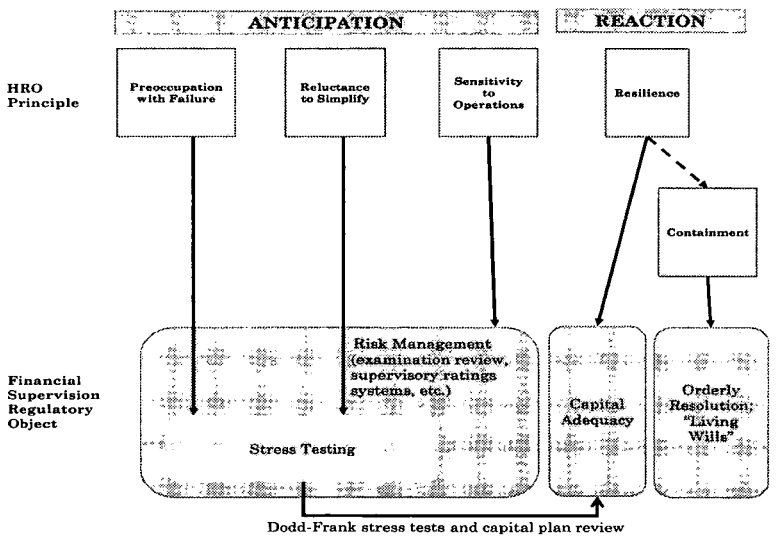
[120] *Id.* at 67,021.

[121] Bank Holding Company Rating System, 69 Fed. Reg. 70,444, 70,444 (Dec. 6, 2004). The risk management (R) component from the new RFI/C(D) system is based on guidance that the FRB had used to rate risk management since 1995. *Id.* at 70,445.

FRB has not announced the mechanism by which it will evaluate nonbank SIFIs, it will likely roll out in the coming years an analogous rating system that also takes into consideration risk management. Supervisory review of operational risk management and supervisory rating systems are but two examples of a wider phenomenon of the supervisory system interfacing with risk management (and, by implication, operational sensitivity and HRO principles of anticipation) as a regulatory object.

Figure 3 below is a diagram depicting financial supervision from an HRO perspective. It maps how supervisors seek to promote HRO norms (both anticipatory and reactive norms) through their regulatory tools and programs.[122]

Figure 3



As discussed earlier, enhanced capital adequacy and orderly resolution authority are motivated by the reactive principles of resilience and containment that populate the right side of the diagram. The diagram reflects the linkages between resilience and containment by showing containment as a component of a

[122] For an explanation of why this Article does not focus on preoccupation with failure and reluctance to simplify, see *supra* notes 76–81 and accompanying text.

large resilience umbrella principle;[123] those principles could have just as easily been separated out as co-equal principles, or reversed so that containment would be a component of resilience. The FRB, by expressly invoking resilience and containment as the two hallmark principles for its "new framework for the consolidated supervision of large financial institutions,"[124] has announced that supervision will occur predominantly in this part of the diagram.

The left side of the diagram illustrates how the principles of anticipation are put to work in the financial industry through the risk management function. As noted earlier, stress testing is properly conceived of as a specialized competence and series of practices undertaken by an organization's risk management function.[125] Although in theory stress testing holds potential as a regulatory tool designed to foster organizational preoccupation with failure and reluctance to simplify, in its present manifestation it is more properly thought of as a capital adequacy tool promoting further resilience,[126] as reflected in the arrow flowing from the stress testing box to the capital adequacy box.

Two hypotheses could explain the supervisory focus on the right side of the diagram. On the one hand, perhaps supervisors are focusing on reforming the right side of the diagram because supervisory efforts on the left side of the diagram are already functioning well. On the other hand, perhaps supervisors are not focusing on the left side due to an institutional disinclination to fully embrace all HRO principles, whether on account of resource constraints, regulatory capture, or a considered decision.

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[123] In doing so, the diagram reflects the Roe and Schulman formulation rather than the Weick and Sutcliffe formulation. *See supra* notes 56–60 and accompanying text (noting that the former authors consider containment to be a part of resilience, and the latter authors consider resilience to be a part of a broader containment principle).

[124] LISCC GUIDANCE LETTER, *supra* note 2, at 1.

[125] *See supra* note 76 and accompanying text.

[126] *See supra* notes 76–79 and accompanying text (explaining how stress tests are integrated into a CCAR program that requires companies to demonstrate their ability to maintain regulatory minimum levels of capital under future stress scenarios before effectuating any distribution to stockholders).

The second hypothesis is more convincing than the first. Existing industry practices and enforcement patterns demonstrate that the existing system of risk management regulation is not functioning well. Notwithstanding the nominal engagement of bank supervisors with bank risk management practices, recent years have witnessed dramatic risk management failures at several of the largest banks. In HRO parlance, these breakdowns evidence a lack of managerial sensitivity to operations. Examples include the 2012 "London Whale" episode at J.P. Morgan Chase & Co. in which the holding company lost $6 billion in connection with a series of unauthorized trades;[127] the discovery in 2014 of a large-scale government procurement fraud involving criminal investigations of high-level executives at Citigroup's Mexican affiliate Banamex, which was valued at up to $40 billion, and responsible for a third of Citigroup's total market capitalization in early 2015;[128] the $9 billion fine levied in 2014 on BNP Paribas, the French lender regulated in part by the FRB, by the U.S. Justice Department for facilitating $190 billion in transactions for Cuban, Sudanese, and Iranian entities and functioning as the de facto "central bank of Sudan for dollar transactions";[129] the 2014 revelation that the Swiss unit of London-based HSBC, also supervised in part by the FRB, has been laundering billions of dollars of funds for nations linked with terrorists (including Iran, Myanmar, Cuba, North Korea and Sudan) and Latin American

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[127] Consent Order, JPMorgan Chase Bank, No. 2013-001 (Dep't of the Treasury Jan. 14, 2013) (OCC Enforcement Action), http://www.occ.gov/static/enforcement-actions/ea2013-001.pdf; *see also* Jake Bernstein, *Secret Tapes Hint at Turmoil in New York Fed Team Monitoring JPMorgan*, PROPUBLICA, Nov. 17, 2014, http://www.propublica.org/article/secret-tapes-hint-at-turmoil-in-new-york-fed-team-monitoring-jpmorgan (documenting inaction by officials tasked with probing JPMorgan before the London Whale trading scandal).

[128] Dolia Estevez, *Citigroup's CEO Denies Rumors It Plans To Sell Mexican Subsidiary Banamex*, FORBES, Jan. 23, 2015, http://www.forbes.com/sites/doliaestevez/2015/01/23/citigroups-ceo-denies-rumors-it-plans-to-sell-mexican-subsidiary-banamex/.

[129] Devlin Barrett et al., *BNP Paribas Draws Record Fine for 'Tour de Fraud': BNP Admits to Filing False Business Records and Conspiracy*, WALL ST. J., June 30, 2014, http://www.wsj.com/articles/bnp-agrees-to-pay-over-8-8-billion-to-settle-sanctions-probe-1404160117.

drug cartels;[130] and the 2012 and 2013 uncovering of large-scale market rigging for basic reference rates underlying trillions of dollars of securities, loans, and derivative contracts by employees of a who's-who of large megabanks, including UBS, Barclays, J.P. Morgan, Citigroup, Royal Bank of Scotland, Société Générale, and Deutsche Bank.[131] In the light of these significant risk management breakdowns, it can hardly be maintained that the lack of post-crisis reform in the area of risk management regulation is explained by the fact that the current system works well at preventing operational failures.

Instead, according to the second hypothesis, the relative lack of post-crisis supervisory reform activity on the left side of diagram reflects the unwillingness of the part of the supervisory agencies—whether on account of resource constraints, regulatory capture, or a considered decision—to become involved with operational sensitivity and the governance and management of risk. Bank supervisory ratings and correspondence relating to supervisors' review of bank risk systems are confidential. As a result, the extent to which supervisors are engaged in a constructive dialogue with industry, backed by the threat of enforcement and enhanced supervisory attention under the ratings system, concerning operational sensitivity and risk management, remains unclear. Obviously, the risk management failures discussed above provide indirect evidence that supervisors are not meaningfully engaged with how financial institutions manage risk and remain

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[130] Ben Protess & Jessica Silver-Greenberg, *HSBC to Pay $1.92 Billion to Settle Charges of Money Laundering*, N.Y. TIMES, Dec. 10, 2012, http://dealbook.nytimes.com/2012/12/10/hsbc-said-to-near-1-9-billion-settlement-over-money-laundering/?_r=0.

[131] *See* Aruna Viswanatha, *Banks to Pay $5.6 Billion to Settle U.S. Probes*, WALL ST. J., May 21, 2015, http://www.wsj.com/articles/global-banks-to-pay-5-7-billion-in-penalties-in-fx-libor-probe-1432130400; Suzi Ring & Liam Vaughan, *Citigroup, JPMorgan Pay Most in $4.3 Billion FX Rig Cases*, BLOOMBERG BUS., Nov. 12, 2014, http://www.bloomberg.com/news/articles/2014-11-12/banks-to-pay-3-3-billion-in-fx-manipulation-probe; Press Release, Bd. of Governors, Fed. Reserve Sys., (May 20, 2015), *available at* http://www.federalreserve.gov/newsevents/press/enforcement/20150520a.htm; Press Release, U.S. Dep't of Justice, Five Major Banks Agree to Parent-Level Guilty Pleas (May 20, 2015), *available at* http://www.justice.gov/opa/pr/five-major-banks-agree-parent-level-guilty-pleas.

operationally sensitive.[132] A recent whistleblower exposé of the holding company-level examination of Goldman Sachs by personnel of the Federal Reserve Bank of New York gives further reason to doubt that examiners are helping to shape risk management practices at the largest banks.[133] The Federal Reserve Bank of New York, for its part, has announced a more conciliatory enforcement posture. Its examiners do not "examine" anymore; instead, they "manage relationships."[134]

The third possible explanation for the second hypothesis—i.e., that supervisors have made a considered judgment that efforts to encourage the HRO principles of anticipation are not advisable—is belied by the steady stream of supervisory involvement with risk management.[135] That this involvement exists contemporaneously with an unwillingness to discipline inadequate risk management and operational sensitivity at large banks through enforcement is a paradox of contemporary banking supervision. Instead, regulatory capture and resource constraints are more plausible explanations for this phenomenon.[136]

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[132] *Cf.* Jonathan B. Wiener, *Risk Regulation and Governance Institutions*, *in* RISK AND REGULATORY POLICY: IMPROVING THE GOVERNANCE OF RISK 133, 135 (2010) ("[A] crucial component of effective risk governance is monitoring performance. Do policies actually work? Do they achieve results?"); Robert Baldwin & Julia Black, *Really Responsive Regulation*, 71 MODERN L. REV. 59, 59 (2008) ("An important test of a regulatory theory is whether it offers assistance in addressing the challenges that regulators face in practice.").

[133] Jake Bernstein, *Inside the New York Fed: Secret Recordings and a Culture Clash*, PROPUBLICA, Sept. 26, 2014, http://www.propublica.org/article/carmen-segarras-secret-recordings-from-inside-new-york-fed; *see also Improving Financial Institution Supervision: Examining and Addressing Regulatory Capture: Hearing Before the Subcomm. on Fin. Insts. and Consumer Prot. of the S. Comm. on Banking, Hous., and Urban Affairs*, 113th Cong. (2014) (testimony of David O. Beim, Professor of Professional Practice, Columbia Business School), *available at* http://www.banking.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=5701479f-f8ef-4558-b0f2-9b03104506cc (testifying before Congress regarding a report he wrote, commissioned in 2009 by the Federal Reserve Bank of New York, which identified a "weak form of regulatory capture," predicated on revolving doors and information asymmetries, as an institutional shortcoming of bank supervisors).

[134] Arthur E. Wilmarth, Jr., *Turning a Blind Eye: Why Washington Keeps Giving in to Wall Street*, 81 U. CIN. L. REV. 1283, 1418 (2013).

[135] *See supra* notes 111–18 and accompanying text.

[136] Some commentators have observed a power shift within the supervisory function of the Federal Reserve System, with influence shifting away from the regional Federal Reserve banks and their examination staffs and toward FRB personnel working at FRB headquarters

Whatever explains this incomplete post-crisis embrace of HRO norms—with its emphasis on principles of reaction over principles of anticipation—it exists as an empirical fact. The post-crisis risk management failures and operational breakdowns mentioned above provide a lens through which we can consider how this existing system of supervision works from an HRO perspective. Fortunately, none of these operational breakdowns resulted in an institutional failure, much less a failure of the financial system. This resilience is a testament, in part, to the enhanced capital positions of banks following the Basel III reforms.[137] It is also a testament to the unwillingness of some prosecutors—including, most famously, U.S. Attorney General Eric Holder—to pursue criminal charges against systemically important financial

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in Washington, particularly the LISCC. *See* Jake Bernstein, *A Stress Test For The New York Fed*, PROPUBLICA, Mar. 10, 2015, https://www.propublica.org/article/a-stress-test-for-the-new-york-fed; *see also supra* note 6 and accompanying text (introducing the LISCC). The Dodd-Frank Act stress tests and the CCAR program, discussed above, should be seen as part of that shift. This intra-agency shake-up within the FRB has the potential to disrupt established patterns of enforcement and examination practices. There are some nascent signs that such a shift is taking place, and that the FRB is showing itself increasingly willing to take banks to task for inadequate operational sensitivity. For example, just this year the FRB has taken two significant actions against Santander USA Holdings, Inc., the U.S. holding company for the large Spanish lender. First, in March 2015 it objected—on qualitative grounds, rather than the quantitative grounds that are usually the focus of the CCAR objections—to Santander's capital plan on account of "widespread and critical deficiencies across [its] capital planning processes. . . . in a number of key areas, including governance, internal controls, risk identification and risk management, management information systems (MIS), and assumptions and analysis that support [its] capital planning processes." BD. OF GOVERNORS, FED. RESERVE SYS., *supra* note 14, at 11. Four months later, the Federal Reserve Bank of Boston and Santander entered into a written enforcement agreement premised on largely the same shortcomings identified in the FRB's objection to the bank's CCAR plan. Written Agreement Between Santander USA Holdings, Inc. and Federal Reserve Bank of Boston, Docket No. 15-018-WA/RB-HC (July 2, 2015), *available at* http://www.federalreserve.gov/newsevents/press/enforcement/enf20150707a1.pdf. While this latter action might seem inconsistent with a power shift away from the regional Federal Reserve banks, the Federal Reserve Bank of Boston piggy-backed on the FRB's March 2015 CCAR plan objection, entering a formal enforcement order (covering matters in addition to the distribution restrictions entailed by the objection to the capital plan) based on the same nexus of qualitative risk management shortcomings.

137 *See supra* notes 10–13 and accompanying text (summarizing increased capital requirements under the Basel III reform).

institutions.[138] The recent rate-rigging criminal settlements evince a greater willingness on the part of prosecutors to pursue criminal charges against banks.[139] Nevertheless, it requires neither a pessimistic outlook nor a fertile imagination to conjure up a scenario where a series of events precipitates a crisis, with or without the threat of criminal prosecutions. To the extent that supervisors forgo meaningful engagement with operational sensitivity and risk management as regulatory objects, they increase the probability that an unexpected series of events will present a threat to institutional or systemic stability, and they also increase the importance of their resilience and containment strategies.

As noted above, the focus on resilience and containment, if not inevitable, is hardly surprising. These reforms were the easiest place to start a supervisory reform process because (1) there existed a political demand for these reforms, which responded to highly salient and comprehensible regulatory breakdowns; and (2) the reforms were tractable, in the sense that they responded to salient failures and they adjusted, or borrowed from, existing regulatory programs. Risk management failures, on the other hand, are too technical and institution-specific to resonate politically and demand administrative policy action—or even, in most cases, ex post enforcement action. The tractability of resilience and containment (through capital adequacy and OLA, respectively) was emphasized earlier.[140] On this score, the differences between operational sensitivity and resilience/containment are less pronounced. As discussed earlier, risk management already exists as a regulatory

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[138] *See Transcript: Attorney General Eric Holder on 'Too Big to Jail,'* 178 AM. BANKER 11, 11 (2013); *cf.* Peter J. Henning, *Attorney General Eric Holder's Mixed Scorecard*, N.Y. TIMES, Apr. 28, 2015, http://www.nytimes.com/2015/04/29/business/dealbook/attorney-general-holders-mixed-scorecard.html?_r=0 (questioning whether Holder placed too much emphasis on penalizing banks rather than prosecuting corporate executives).

[139] *See supra* note 131 and accompanying text (discussing settlement agreements between banks, the Justice Departments and the Federal Reserve after five financial institutions pled guilty to conspiracy to manipulate the U.S. dollar-Euro exchange rate).

[140] *See supra* notes 25–26 and accompanying text (explaining how the Basel III capital reforms and the OLA are extensions of, respectively, the capital adequacy system and the prompt corrective action resolution regime).

object. Even if risk management is not a salient *political* concern, it is a *tractable* regulatory object. Although supervisors have been hesitant to use their formal enforcement authority as a lever to force changes in industry practices, such a state of affairs is not preordained.

If supervisors take up the task of encouraging operational sensitivity at financial institutions, their efforts should be conceptualized as attempts to change organizational culture. If nothing else, the existence of HROs is a testament to the importance of organizational culture. Simply put, some organizations are readier than others to weather the storm of the unexpected. If high reliability theory provides a useful lens with which to analyze efforts by the FRB (and other supervisors) to reform supervision, it bears mentioning the perhaps prosaic observation that HRO principles are not fixed endowments of organizations or systems. Organizations have differing incentives when it comes to the importance of investing in and committing to reliability in management.[141] Recent experience demonstrates amply that the default corporate governance rules, existing supervisory patterns, and managerial labor markets for large bank holding companies do not, on their own, produce highly reliable financial institutions.

That said, we can imagine other infrastructural systems for which private management does suffice to produce high levels of reliable management. Different factors explain such performance. For instance, Joseph Rees chronicles how nuclear power plant utilities mobilized an industry trade association, forged by a shared "industrial morality" premised on a recognition that they were all "hostages of each other," that committed itself thoroughly to reliable and safe operations in the aftermath of the Three Mile Island disaster.[142] Operational culture can emphasize reliability too, as the much-discussed *kaizen* manufacturing system in Japan

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[141] *See* La Porte, *supra* note 35, at 63 (discussing the social and technical relationships which shape the "social, structural, and decisional character" of HROs).

[142] *See* JOSEPH V. REES, HOSTAGES OF EACH OTHER: THE TRANSFORMATION OF NUCLEAR SAFETY SINCE THREE MILE ISLAND 173–77 (1994).

demonstrates.[143] Researchers have also identified military organizational settings as being particularly receptive to high reliability norms.[144] These examples demonstrate that an institution's orientation to reliability is malleable and plastic rather than static. So far, post-crisis reformers have eschewed supervisory policies aimed at making operational culture more sensitive to operations, but that is not to say that there is not scope for potential regulatory activity in that area.

The effort to increase operational sensitivity through improved risk management is not a finance-specific charge. Today, the administrative state[145] is in many respects a risk management state.[146] Regulation is often referred to as "risk-based regulation."[147] Oftentimes, risk-based regulation will entail the deployment of public administrative power to act on, and with, decentralized industry participants, seeking to promote public goals by influencing industry practices and experimental solutions.[148] Regulation becomes "management-based regulation,"[149] "conversational" regulation,[150] "meta-regulation,"[151] or "meta risk management."[152] It acts on

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[143] *See* William H. Simon, *Toyota Jurisprudence: Legal Theory and Rolling Rule Regimes*, *in* LAW AND NEW GOVERNANCE IN THE EU AND THE US 37, 45 (Gráinne de Búrca & Joanne Scott eds., 2006) (highlighting how *kaizen*, meaning "continuous improvement," entails a commitment to "zero tolerance" for failure).

[144] *See* Karlene H. Roberts, *New Challenges in Organizational Research: High Reliability Organizations*, 3 ORG. & ENVIRON. 111 (1989).

[145] Adrian Vermeule, *The Administrative State: Law, Democracy, and Knowledge*, *in* THE OXFORD HANDBOOK OF THE U.S. CONSTITUTION 259, 259 (Mark Tushnet et al. eds., 2015) (noting that "the modern state is, by any conceivable measure, largely an administrative state" comprised of a "massive and elaborately reticulated bureaucracy that structures and constitutes the experience of government for almost all citizens").

[146] *See supra* notes 43–47 and accompanying text.

[147] Julia Black & Robert Baldwin, *Really Responsive Risk-Based Regulation*, 32 LAW & POL'Y 181 (2010).

[148] *See, e.g.*, Cary Coglianese & David Lazer, *Management-Based Regulation: Prescribing Private Management to Achieve Public Goals*, 37 LAW & SOC'Y REV. 691, 693–96 (2003) (noting the particular applicability of this regulatory mode to problems that, much like financial risk, are characterized by heterogeneous circumstances and difficult-to-monitor outputs of regulatory concern).

[149] *Id. passim*.

[150] JULIA BLACK, RULES AND REGULATORS 37 (1997).

[151] CHRISTINE PARKER, THE OPEN CORPORATION: EFFECTIVE SELF-REGULATION AND DEMOCRACY 15 (2002).

process (e.g., internal controls) rather than outcomes (e.g., fines, damage awards, or license revocations) or inputs (e.g., procedural requirements or technological prescriptions). Some commentators view this trend with skepticism, seeing risk management regulation less as a rationalistic, scientific method of improving particular corporate practices, and more as a reflection of normative, political demands and aspirations for accountability and control.[153] Simplifying only somewhat, the skeptics interpret regulatory efforts to influence risk management norms as a response to political demands that the state reduce risks about which the citizenry is increasingly concerned. On their view, the link between the public regulatory aims and the public regulatory praxis has thus been severed.[154] Other skeptics level a more modest critique, limiting their quarrel to the normative assumptions underlying regulatory efforts to assess risk, which presumes that risk regulation is a straightforward, linear exercise.[155] To these critics, the discipline of risk management regulation, and risk regulation more generally, is a

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[152] John Braithwaite, *Meta Risk Management and Responsive Regulation for Tax System Integrity*, 25 LAW & POL'Y 1, 1 (2003); *see also* AYRES & BRAITHWAITE, *supra* note 24, at 19–53 (outlining a model for "enforced self-regulation" where the regulatory agencies wield a "benign big gun" enforcement approach, working collaboratively with industry to achieve public regulatory objectives but also remaining ready to deploy sanctions on actors that defect from collaborative governance mode).

[153] *See, e.g.*, Weber, *supra* note 4, at 1015–58. Michael Power has written extensively on this theme for nearly two decades. *See* MICHAEL POWER, THE AUDIT SOCIETY: RITUALS OF VERIFICATION (1997); MICHAEL POWER, ORGANIZED UNCERTAINTY: DESIGNING A WORLD OF RISK MANAGEMENT 3 (2007).

[154] In this respect, the critiques of risk management regulation recall Ulrich Beck's dire pronouncement that modern history has moved into a new era in which instrumental, rationalist expertise no longer serves a legitimating role. *See supra* note 33 and accompanying text (introducing Beck's "risk society" thesis).

[155] *See* Elizabeth Fisher, *Framing Risk Regulation: A Critical Reflection*, 4 EUR. J. RISK REG. 125, 131 (2013) ("The problem is that the dominance of the risk assessment/risk management framework constrains thinking more creatively because it presumes that the regulation of risk is straightforward."); Sheila Jasanoff, *The Songlines of Risk*, 8 ENVT'L VALUES 135, 141 (1999) ("Formal risk assessment, I would like to propose, is the 'songline' of contemporary risk society's anxiety about its own technological achievements. Threats dimly conceived in the mind must be sung in this melody to exist and be perceived, as well as predicted and controlled.").

necessary challenge that has to date not been adequately theorized and implemented in administrative law and policy.

This too is a debate for elsewhere, although the fact that bank supervisors have identified but not enforced a regulatory space with a high degree of private sector dysfunction (i.e., risk management/operational sensitivity) certainly supports the skeptics' position. That said, even the skeptics must acknowledge that HRO theorists have demonstrated that sensitivity to operations matters—as an operational matter. All organizational cultures are not created equal. And, by implication, all organizational cultures are amenable to change, at least as a theoretical matter. HRO theory gives supervisors (and the lawmakers under whose authority they act) a lens through which to view efforts to regulate risk management, conceiving of it as an attempt to promote a reliable organizational culture better equipped to anticipate the unexpected.

VII. CONCLUSION

So far, post-crisis supervisory reform efforts have privileged principles of reaction over principles of anticipation. In so doing, the reform agenda has embraced HRO principles, but only in part. Institutional and political forces conspire to prevent a more meaningful engagement with risk management. This hesitancy is consistent with supervisors' historic unwillingness to conduct meaningful *ex ante* enforcement of unsafe and unsound practices at banks. Recent risk management failures at large banks serve as a reminder that unexpected operational stresses always lurk around the future's corner. So far, the financial system, protected by the supervisory apparatus, has proven itself sufficiently reliable in the post-crisis period. But HRO theory teaches us to be forewarned that resilience and containment do not, on their own and without a commitment to the principles of anticipation (including sensitivity to operations), guarantee reliable private ordering.