ADAPTIVE FINANCIAL REGULATION AND REGTECH: A CONCEPT ARTICLE ON REALISTIC PROTECTION FOR VICTIMS OF BANK FAILURES

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ABSTRACT

Frustrated by the seeming inability of regulators and prosecutors to hold bank executives to account for losses inflicted by their companies before, during, and since the financial crisis of 2008, some scholars have suggested that private-attorney-general suits such as class action and shareholder derivative suits might achieve better results. While a few isolated suits might be successful in cases where there is provable fraud, such remedies are no general panacea for preventing large-scale bank-inflicted losses. Large losses are nearly always the result of unforeseeable or suddenly changing economic conditions, poor business judgment, or inadequate regulatory supervision—usually a combination of all three.

Yet regulators face an increasingly complex task in supervising modern financial institutions. This Article explains how the challenge has become so difficult. It argues for preserving regulatory discretion rather than reducing it through formal congressional direction. The Article also asserts that regulators have to develop their own sophisticated methods of automated supervision. Although also not a panacea, the development of "RegTech" solutions will help clear away volumes of work that understaffed and underfunded regulators cannot keep up with. RegTech will not eliminate policy considerations, nor will it render regulatory decisions noncontroversial. Nevertheless, a sophisticated deployment of RegTech should help focus regulatory discretion and public-policy debate on the elements of regulation where choices really matter.

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FOREWORD

It is a privilege and pleasure to participate in a symposium dedicated to my distinguished friend and colleague, Jim Cox. I have always been in awe of Jim's prodigious scholarship and the reputation he has rightly earned as the nation's leading market-regulation authority. Jim's concern for the victims of market misconduct has been persistent and forceful, perhaps even at the cost of opportunities that might have brought him greater financial reward and political prestige. I can only hope that my somewhat perverse approach to the problem of bank failures does not disappoint him for being insufficiently aggressive toward bankers and the banking markets. I know his friendship would never allow him to show that disappointment, even if he felt it.

INTRODUCTION

In the lingering aftermath of the 2008 financial crisis, popular anger about the damage wrought on the economy and individual welfare still simmers.[1] This anger visibly flared up again in the 2016 presidential election process.[2] Financial companies, particularly as

1. The continuing level of public anger is quite remarkable. Five years after the 2008 crisis, reports of this anger were quite commonplace. *See, e.g.*, Michael Erman, *Five Years After Lehman, Americans Still Angry at Wall Street: Reuters/Ipsos Poll*, REUTERS (Sept. 15, 2013), http://www.reuters.com/article/us-wallstreet-crisis-idUSBRE98E06Q20130915 [https://perma.cc/682M-RA3S] (summarizing the results of an extensive poll of public opinion). Yet even in the 2016 presidential election, the impact of the 2008 crisis continued to loom large, and reform proposals thought to be necessary were important policies on the agenda of both presidential nominees and even played a role in the polarization of politics abroad. *See, e.g.*, Victoria Stilwell & Sarah McGregor, *Angry Americans: How the 2008 Crash Fueled a Political Rebellion*, BLOOMBERG POLITICS (Mar. 1, 2016, 5:00 AM), http://www.bloomberg.com/politics/articles/2016-03-01/the-angry-americans-trump-sanders-and-the-aftershocks-of-2008 [https://perma.cc/L5TQ-682H] (discussing the impact of this anger on presidential campaign platforms); Amir Sufi, *Thank the Financial Crisis for Today's Partisan Politics*, EDUC. POST (July 15, 2016), http://www.educationpost.com.hk/resources/mba/160715-mba-insights-thank-the-financial-crisis-for-today-s-partisan-politics [https://perma.cc/ZCJ4-WX2D] (discussing the dynamics of anger directed at the 2008 crisis and how this anger has led to deep political polarization).

2. President-elect Donald Trump and the Republican Party platform added a call for restoring the divide between commercial and investment banking, to the consternation of big finance supporters within the Republican Party. *See, e.g.*, Donna Borak, *GOP Platform Calls for Revival of Glass-Steagall*, WALL STREET J. (July 19, 2016, 6:31 PM), http://www.wsj.com/articles/gop-platform-calls-for-revival-of-glass-steagall-1468876558 [https://perma.cc/NGY2-985D]. Then-nominee Hillary Clinton vowed to impose stricter regulation on big banks. *See id.* For a survey of the political events leading to the insertion of a call for reform in the platforms for both parties, see Pam Martens & Russ Martens, *Both Democrat and Republican Platforms Have Had It with Frankenbanks*, WALL STREET ON PARADE (July 19, 2016), http://wallstreetonparade.

embodied by big banks and Wall Street, are the primary objects of this public fury. In this motif, bankers have become banksters and banks have become too big to jail—even in the view of some judges and commentators.[3] Regulators have been excoriated for being captured or at least asleep at the switch in their failure to prevent the 2008 crisis and for bailing out some of the world's biggest banks and other financial companies.

The wreckage following the 2008 crisis is strewn with individual and multiparty lawsuits and complex multigovernment and multiparty settlements. Billions of dollars have been paid out by banks and other financial companies as reparations for securities frauds and violations of the federal False Claims Act.[4] Yet successful private class action suits[5] against financial institutions have actually been few and far between,[6] and a majority of the crisis-related actions have

com/2016/07/both-democrat-and-republican-platforms-have-had-it-with-frankenbanks [https://perma.cc/KBN5-5WG4].

3. One of the most prominent judicial critics is U.S. District Judge Jed S. Rakoff. *See, e.g.*, Jed S. Rakoff, *The Financial Crisis: Why Have No High-Level Executives Been Prosecuted?*, N.Y. REV. BOOKS (Jan. 9, 2014), http://www.nybooks.com/articles/2014/01/09/financial-crisis-why-no-executive-prosecutions [https://perma.cc/M9S5-L7MZ]. Former federal prosecutor Bill Black has waged a relentless attack on what he terms "banksters." *See, e.g.*, William K. Black, *Hillary, the Banksters Committed 'Fraud,' Not 'Shenanigans*,' HUFFINGTON POST (Feb. 5, 2016), http://www.huffingtonpost.com/william-k-black/hillary-the-banksters-com_b_9164930.html [https://perma.cc/UDZ6-4QWF].

4. A long string of enforcement actions against banks has developed in the aftermath of the 2008 crisis. Most prominent among these are fines for Libor violations and violations of tax regulations and anti-money-laundering legislation. *See, e.g.*, *BSA-AML Civil Money Penalties*, BANKERSONLINE, https://www.bankersonline.com/penalty/penalty-type/bsa-aml-civil-money-penalties [https://perma.cc/79VS-ACG9] (providing an ongoing record of Bank Secrecy Act and Anti-money-laundering regulation violations by banks); *Tracking the Libor Scandal*, N.Y. TIMES: DEALBOOK (Mar. 23, 2016, 8:49 AM), https://www.nytimes.com/interactice/2015/04/23/business/dealbook/db-libor-timeline.html/#time370_10900 [https://perma.cc/K2L2-PXUV] (providing ongoing reporting of the actions against banks and bankers for Libor violations); Robert W. Wood, *More Banks Spill Tax Evasion Secrets to Avoid Criminal Charges, Account Holders Beware*, FORBES (Nov. 20, 2015), http://www.forbes.com/sites/robertwood/2015/11/20/many-banks-avoid-u-s-tax-evasion-charges-hunt-for-americans-continues/#3e2627be1cc4 [https://perma.cc/F9FT-F274] (listing the many banks that have been subject to enforcement actions for helping clients evade taxes).

5. For purposes of this Article, private class action suits and shareholder derivative suits are treated as the same type of remedial pursuit.

6. For annual reports tracking and analyzing class action filings and settlements, including those against financial-sector companies, see *Securities Class Action Clearinghouse: A Collaboration with Cornerstone Research*, STANFORD LAW SCH. & CORNERSTONE RESEARCH, http://securities.stanford.edu [https://perma.cc/2QTL-XH35]. According to Clearinghouse data, courts saw roughly two hundred class action filings between 2007 and 2011 involving claims related to the credit crisis. *See* CORNERSTONE RESEARCH, SECURITIES CLASS ACTION FILINGS—2012 YEAR IN REVIEW 3 fig.2 (2013) (listing credit-crisis-related class actions over

failed.[7] Amid a perception that regulators and prosecutors are either incapable of taking or unwilling to take sufficient remedial action to punish financial miscreants and render victims of financial wrongs whole, critics have suggested that private-attorney-general suits and shareholder derivative suits might be the best complement to a generally deficient enforcement regime.[8]

This potential solution to regulatory and prosecutorial shortcomings has a facial attractiveness. Class action suits can often dig where regulators have not gone or sometimes cannot go. Even the extensive inspection powers of regulators might not always uncover information secured in discovery and depositions. In the private litigation tradition, such suits can build upon actual events and delve further, subjecting a complex train of events leading to financial loss to the rigor of discovery, trial, and the judgment of peers. Even when settled before trial, such suits can not only secure reparations but also

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time). The Clearinghouse analyses determined that "credit-crisis filings have significantly lower settlement rates compared to non-credit-crisis filings." CORNERSTONE RESEARCH, SECURITIES CLASS ACTION FILINGS—2010 YEAR IN REVIEW 6 (2011). And the group's 2015 analysis reported that credit-crisis-related filings have higher dismissal rates and slightly lower settlement rates compared with class actions in general. CORNERSTONE RESEARCH, SECURITIES CLASS ACTION FILINGS—2014 YEAR IN REVIEW 13 (2015).

7. The most prominent of these cases is *FDIC ex rel. Coop. Bank v. Rippy*, 799 F.3d 310 (4th Cir. 2015), discussed further in note 24 below. Very few 2008-crisis-related class action lawsuits appear to have survived dismissal motions, reached a jury, or even been settled. One case reached a jury verdict, leading to a partial award in the plaintiffs' favor, but this verdict was subsequently set aside by the Eleventh Circuit for absence of evidence indicating that losses were caused by securities fraud and not the overall market conditions leading to the 2008 crisis. Hubbard v. BankAtlantic Bancorp, Inc., 688 F.3d 713, 730 (11th Cir. 2012). *See generally, e.g.*, Christopher J. Miller, *"Don't Blame Me, Blame the Financial Crisis": A Survey of Dismissal Rulings in 10b-5 Suits for Subprime Securities Losses*, 80 FORDHAM L. REV. 273 (2011) (observing that the very fact of the 2008 crisis has made it more difficult to be successful in financial securities fraud suits because losses can be attributed to economic conditions broader than those over which the defendants have control).

8. *See generally, e.g.*, Elizabeth Chamblee Burch, *Securities Class Actions as Pragmatic* Ex Post *Regulation*, 43 GA. L. REV. 63 (2008) (arguing, in the context of securities regulation rather than bank regulation, that securities class actions play a vital role in preventing regulatory power from concentrating solely in corporate actors); J. Maria Glover, *The Structural Role of Private Enforcement Mechanisms in Public Law*, 53 WM. & MARY L. REV. 1137 (2012) (advocating a strengthening of the mechanisms of private class action litigation as an important supplement to regulation in the modern administrative state); Melanie Gray, Vanessa Chandis & Kristen M. Echemendia, *Striking the Right Balance: Public Versus Private Enforcement Laws—What Will We Learn from This Financial Meltdown?*, 60 SYRACUSE L. REV. 449 (2010) (making the case that private enforcement actions are a necessary complement to public regulation); Mark Klock, *Improving the Culture of Ethical Behavior in the Financial Sector: Time to Expressly Provide for Private Enforcement Against Aiders and Abettors of Securities Fraud*, 116 PENN ST. L. REV. 437 (2011) (advocating broader use of private-attorney-general suits to foster a stronger culture of integrity and ethical conduct in the auditing profession).

operate to shape future financial conduct. Being privately funded, class action suits are neither dependent on government appropriations nor susceptible to industry capture. These advantages appear to be as good as confirmed by the hostility toward them on the part of industry organizations.[9] Thus, in an era of widespread regulatory failure, class action suits seem to offer a private, ex post solution that might actually function as the "dark matter" of regulation—perhaps overlooked, but integral to the system.

Yet traditional bank regulation itself no longer offers a generally effective way to prevent or diminish widespread financial collapse. Although, as emphasized below, such regulation plays a continuing and vital role in cabining financial institutions within accepted risk frameworks, it has also become highly formalized. This is a consequence of public and congressional anger during and after the savings-and-loan (S&L) crisis of the 1980s, in which regulatory enforcement powers were intensified and a range of unsafe bank activities were criminalized or made more easily actionable.[10] The formalization process, in turn, helped to promote a public view that bank failures are usually the result of fraudulent activity, and this transformation in opinion might have led some to the view that shareholder derivative and class action suits should become important elements in bank safety regulation.[11] As this Article argues, such a view is based on a mistaken understanding of most of the activities and actions that lead to bank failure. In reality, effective bank supervision and the prevention of bank failure involve a constant series of difficult

9. *See, e.g.*, U.S. CHAMBER INST. FOR LEGAL REFORM, WHAT'S WRONG WITH SECURITIES CLASS ACTION LAWSUITS? (2014), http://www.instituteforlegalreform.com/uploads/sites/1/Securities_Class_Actions_Final1.pdf [https://perma.cc/US45-7PBB].

10. A series of major statutes were passed in the wake of the S&L crisis in the 1980s, the failure of a number of national banks into the 1990s, and rising concerns about money laundering by drug cartels, each of which in turn provided political momentum for increasing the intensity of public regulation over financial institutions. These statutes, coupled with numerous implementing regulations, were the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989, Pub. L. No. 101-73, 103 Stat. 183 (codified in scattered sections of 12 U.S.C.) (reorganizing the fragmented enforcement powers of the bank regulatory agencies and substantially strengthening them); the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991, Pub. L. No. 102-242, 105 Stat. 2236 (codified in scattered sections of 12 U.S.C.) (introducing the preemptive power of "prompt corrective action"); the Crime Control Act of 1990, Pub. L. No. 101-647, 104 Stat. 4789 (codified in scattered sections of the U.S. Code) (authorizing prejudgment assets attachments); and the Annunzio-Wylie Money-Laundering Act of 1992, Pub. L. No. 102-550, 106 Stat. 4044 (codified in scattered titles of the U.S. Code) (adding money laundering as the basis for regulator enforcement powers to remove bank officers and directors).

11. *See supra* note 8 and accompanying text.

judgments, much akin to the "business judgments" covered by the business judgment rule,[12] and failures in such decisionmaking very seldom constitute actionable fraud. The ineffectiveness of private enforcement actions such as shareholder derivative and class action suits leaves open the question of how we might impose mechanisms for avoiding or reducing the risk of serious financial failure. This Article argues that public regulation cannot be replaced but should instead be modernized, using the advances of technology ("RegTech"), to enable regulators to keep up with the very rapid evolution of markets and their underlying technological development.

I. WHY CLASS ACTION SUITS CAN PROVIDE ONLY LIMITED RELIEF

The class action–private-attorney-general model cannot perform the functions some might expect of it. This is because that model is based on a framework directed at market misconduct, a framework that is both unsuitable to and incapable of influencing bank performance in ways that really would prevent bank failure and serious consequential losses to customers, clients, taxpayers, and the general public. The private-attorney-general model, in which securities-fraud and shareholder-derivative-suit litigants provide ex post retribution for failures in financial decisions, cannot address what is necessary to avoid or at least minimize the consequences of bank failure or emergency bank bailouts. Not only is such litigation ex post, taking place long after the disaster has occurred, it is also focused on specific institutions and not the overall systemic role of financial institutions.[13] Avoiding the consequences of bank failures can only be achieved by a combination of real market discipline and either adequate bank regulation or a massive restructuring encompassing the financial industry and perhaps the entire economic system—if such avoidance is attainable at all. Economic markets, financial and otherwise, are complex systems that are not well reformed by sporadic, ad hoc litigation.

12. *See infra* notes 24–27 and accompanying text.

13. The nature of shareholder derivative and private-attorney-general suits is that they are ex post: as a fundamental standing requirement, they can only take place after the damage has occurred.

A. Nature of Financial Markets

Financial markets are inherently dynamic and volatile.[14] Existing in a state of constant and rapid revolution, they are quintessential *complex adaptive* systems.[15] The inherently volatile nature of financial markets is primarily attributable to their position at the center of a web of interconnected markets. National and global banking markets are intertwined, not only with each other but also with a far-flung, convoluted, and even more labile "shadow banking system" that itself forms many different boundaries and textures in different parts of the great global market.

Banks are also intimately connected with governments, themselves subject to rapidly changing political preferences. Banks are important participants in the huge government-debt market.[16] They are

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14. Santa Fe Institute Economist W. Brian Arthur states this well: "The economy is a vast and complicated set of arrangements and actions wherein agents . . . buy and sell, speculate, trade, oversee, bring products into being, offer services, invest in companies, strategize, explore, forecast, compete, learn, innovate, and adapt. [This represents] a massively parallel system of concurrent behavior." W. BRIAN ARTHUR, COMPLEXITY AND THE ECONOMY 2–3 (2015). Such understanding of financial markets is now commonplace, with vast swaths of academic and scientific writing addressing the complex adaptive nature of these markets. Complexity science is now gaining a strong foothold, even in official thinking about how markets should be regulated. *See, e.g.*, Nicholas Albertini, *The US Treasury OFR and CFPB: A Paradigm Shift to Complexity Economics*, OPEDNEWS (Mar. 11, 2012, 8:14 AM), http://www.opednews.com/articles/The-US-Treasury-OFR-and-CF-by-Nicholas-Albertini-120307-137.html [https://perma.cc/8PPY-MXSS] (reporting on the adoption of complexity-science thinking by key financial regulators in the U.S. federal government); U.K. GOV'T OFFICE FOR SCI., THE GLOBAL FINANCIAL MARKETS: AN ULTRA-LARGE-SCALE SYSTEMS PERSPECTIVE 7–12 (2011), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289012/11-1223-dr4-global-financial-markets-systems-perspective.pdf [https://perma.cc/S39S-VHDE] (providing a U.K. government analysis describing global financial markets as a complex "system-of-systems" (emphasis omitted)).

15. The pioneering work by Arthur and others at the Santa Fe Institute stands out in helping us understand economic markets as complex adaptive systems possessing the features of dynamism, power laws and fragility, network codependence, and contagion. *See, e.g.*, ARTHUR, *supra* note 14, at 1–29 (explaining the "complexity economics" approach); Lawrence G. Baxter, *Betting Big: Value, Caution and Accountability in an Era of Large Banks and Complex Finance*, 31 REV. BANKING & FIN. L. 765, 852–68 (2012) (outlining the features of complexity science and the extensive literature on this subject). For some accessible and leading thinking on the application of complexity science to bank regulation, see generally Stefano Battiston, J. Doyne Farmer, Andreas Flache, Diego Garlaschelli, Andrew G. Haldane, Hans Heesterbeek, Cars Hommes, Carlo Jaeger, Robert May & Marten Scheffer, *Complexity Theory and Financial Regulation*, 351 SCIENCE 818 (2016); Andrew G. Haldane & Robert M. May, *Systemic Risk in Banking Ecosystems*, 469 NATURE 351 (2011).

16. When serving as "primary dealers," the trading counterparties of governments in their implementation of monetary policies, *see Primary Dealers List*, FED. RES. BANK OF N.Y., https://www.newyorkfed.org/markets/pridealers_current.html [https://perma.cc/R35F-QP85], banks around the world create the very markets that buy the debts that governments issue. *See*

key elements in the management of the money supply and the provision of liquidity in international, national, and local economies.[17] For example, banks are central to the implementation of national housing policy[18] and indispensable to government when a large financial institution has to be rescued. Notwithstanding the popular belief that they are "private" entities, in many important respects banks are "instrumentalities of the state" and very salient, tangible extensions of the sovereign.[19]

Our models of regulation and private litigation, however, fail to address this market reality. We aspire to the ideals of the rule of law, which, in the expectations of many participants in the financial markets, are interpreted as requiring a framework of bright-line rules and prohibitions stipulated in advance as the "rules of the game." These rules and prohibitions provide the basis for regulatory enforcement actions and private litigation. Yet there is nothing "bright-line" about financial markets, at least beyond evanescent moments, nor has there ever been. The participants in financial markets consist of a wide array of individuals and institutions who are—even with the best of intentions—still *strategic* agents. They constantly adapt to rules in a giant and continuous revelation of "Goodhart's Law," which articulates the ephemeral nature of any form

generally, e.g., Marco Arnone & George Iden, *Primary Dealers in Government Securities: Policy Issues and Selected Countries' Experience* (Int'l Monetary Fund, Working Paper WP/03/45, 2003), https://www.imf.org/external/pubs/ft/wp/2003/wp0345.pdf [https://perma.cc/HK2Y-YX3T] (detailing how a primary-dealer system operates and cataloguing the primary-dealer systems of various nations).

17. *See, e.g.*, Anil K. Kashyap, Raghuram Rajan & Jeremy C. Stein, *Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-Taking*, 57 J. FIN. 33, 33–35 (2002).

18. In the United States, for example, national housing policy, which is designed to promote home ownership, is heavily dependent on the interaction between banks and the government-sponsored enterprises that provide the guarantees supporting asset securitization. *See generally, e.g.*, Nicola Cetorelli & Stavros Peristiani, *The Role of Banks in Asset Securitization*, FRBNY ECON. POL'Y REV., July 2012, https://www.newyorkfed.org/medialibrary/media/research/epr/12v18n2/1207peri.pdf [https://perma.cc/K2P4-37RE] (describing "the principal roles in securitization").

19. *See, e.g.*, Baxter, *supra* note 15, at 818–25.

of "target regulation."[20] Anticipatory or prophylactic command-and-control regulation quickly falls out of sync with market reality.[21]

Private ex post lawsuits, based on violations of law and probable legal standards, must demonstrate causes of action that point to relatively clear breaches of law, such as fraud or statutory violations. A reversal by the Second Circuit of civil fraud awards entered against Bank of America, N.A.; Countrywide Home Loans, Inc.; and Countrywide Bank, FSB demonstrates how very difficult it is to obtain a determination of fraud in financial suits.[22] Exacting standards for proving intent to commit fraud apply, and these standards are almost never met.[23] Even where intent can be pinpointed within the organization, in attempting to meet such standards of proof, fraud suits also cannot prevail in the face of the business judgment rule, which respects the fact that market participants must exercise discretionary

20. Goodhart's Law has acquired this name in reference to an observation by London School of Economics economist Charles Goodhart that target regulation is inherently self-defeating because strategic action will be taken to work around the targets. For an analysis of the operation of Goodhart's Law, see generally K. Alec Chrystal & Paul D. Mizen, Goodhart's Law: Its Origins, Meaning and Implications for Monetary Policy (Nov. 12, 2001) (unpublished manuscript), http://www.cyberlibris.typepad.com/blog/files/Goodharts_Law.pdf [https://perma.cc/H8H3-TDMC].

21. Market discipline, the theory that market participants indirectly "police" each other when they act in their own interests, helps to keep these rapidly evolving markets rational. However, the market discipline theory also has its weaknesses, insofar as it depends on equal bargaining power, complete information transparency, and an absence of fraud. Market discipline, therefore, is reliant on effective regulation to be effective. For an example of the shortcomings of market discipline, see generally David Min, *Understanding the Failures of Market Discipline*, 92 WASH. U. L. REV. 1421 (2015). Market participants are also able to quickly "work around" rules. *See* Ran Duchin & Denis Sosyura, *Safer Ratios, Riskier Portfolios: Banks' Response to Government Aid*, 113 J. FIN. ECON. 1, 1–2, 20 (2014) (demonstrating that by making subtle changes in their portfolios to increase the risks of specific assets, banks are able to increase income while staying within regulatory guidelines, even though their resulting portfolios are much riskier); Emily Flitter, *Emails Show JPMorgan Tried to Flout Basel Rules: Senate*, REUTERS (Mar. 14, 2013, 5:48 PM), http://www.reuters.com/article/us-jpmorgan-whale-basel-idUSBRE92D19Y20130314 [https://perma.cc/T6WT-EXS2] (summarizing a Senate report that found that the bank's risk methodology was adjusted to achieve results contrary to the spirit of the regulatory prohibitions).

22. United States *ex rel.* O'Donnell v. Countrywide Home Loans, Inc., 822 F.3d 650, 666 (2d Cir. 2016), *rev'g* 83 F. Supp. 3d 528 (S.D.N.Y. 2014). In the trial court, the financial institutions had been found liable by a jury for mail and wire fraud under an explicit statutory provision in FIRREA § 951, 12 U.S.C. § 1833a (2012). *Id.* at 653–55. For more examples of cases bolstering the complaint that banks and their executives are not held accountable, see *supra* note 7.

23. *See Countrywide*, 822 F.3d at 656–66 (detailing the extensive evidentiary requirements for both common law and statutory fraud, as well as the insufficiency of the government's proof in the case).

judgment in the face of constantly evolving circumstances.[24] For example, a court recently explained that "corporations are *expected* to take risks and their directors and officers are entitled to protection from the business judgment rule when those risks turn out poorly."[25] Where "defendants do not display a conscious indifference to risks and where there is no evidence to suggest that they did not have an honest belief that their decisions were made in the company's best interests, then the business judgment rule applies even if those judgments ultimately turned out to be poor."[26] But it is defaults of business judgments, not fraud, that are almost always the most important when large individual institutions fail, particularly when these institutions are caught in the vortex of a systemic crisis.[27] Such institutions are usually able to withstand episodic frauds as long as they are not sufficiently massive to destroy enough capital to plunge the institution into bankruptcy, as occurred in the failure of Barings Bank in 1995.[28]

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24. *See* Gimbel v. Signal Cos., 316 A.2d 599, 608 (Del. Ch. 1974) (discussing the presumption of bona fides on the part of directors). A recent case, *FDIC ex rel. Cooperative Bank v. Willetts*, although later partially vacated by the Fourth Circuit based on a different reading of the rule, illustrates the business judgment rule's power. The court noted:

> Cooperative's pursuit of the challenged loans was in furtherance of Cooperative's goal to grow to a $1 billion institution and stay competitive with other regional and national banks making substantial inroads into its territory. . . . The record can simply not support a finding that the defendants' business purpose fell so far beyond lucid behavior that it could not even be considered "rational." Although there were clearly risks involved in Cooperative's approach, the mere existence of risks cannot be said, in hindsight, to constitute irrationality.

FDIC *ex rel.* Coop. Bank v. Willetts, 48 F. Supp. 3d 844, 851 (E.D.N.C. 2014), *aff'd in part, rev'd in part, vacated in part sub nom*. FDIC *ex rel.* Coop. Bank v. Rippy, 799 F.3d 310 (4th Cir. 2015). *Willetts* was partly vacated by the Fourth Circuit on evidentiary grounds. *Rippy*, 799 F.3d at 314. For a discussion of the similar hurdles faced by shareholder-derivative-suit litigants attempting to seek recompense for excessive executive compensation, see James D. Cox & Randall S. Thomas, *Corporate Darwinism: Disciplining Managers in a World with Weak Shareholder Litigation* (Eur. Corp. Governance Inst., Law Working Paper No. 309, 2016). *See also, e.g.*, Cent. Laborers' Pension Fund *ex rel.* JPMorgan Chase & Co. v. Dimon, 638 Fed. App'x 34, 38 (2d Cir. 2016) (discussing the protections afforded to directors taking good-faith actions, irrespective of how ill-advised those actions may have been).

25. *Willetts*, 48 F. Supp. 3d at 851 (emphasis added).

26. *Id.* (citing State v. Custard, No. 06-CVS-4622, 2010 WL 1035809, at *22–23 (N.C. Super. Ct. Mar. 19, 2010)).

27. As Professor Samuel Buell has observed in his work on the difficulties of holding firms and their employees accountable for fraud in the criminal context, "[t]he lines can be very fine between ordinary commerce and criminal wrongdoing." SAMUEL W. BUELL, CAPITAL OFFENSES: BUSINESS CRIME AND PUNISHMENT IN AMERICA'S CORPORATE AGE 40 (2016).

28. Trader Nick Leeson placed wrong-way bets in an attempt to recover trading losses, inflicting such great losses over a few weeks (more than £800 million) that his bank, Barings, collapsed and had to be sold by the Bank of England to ING. For an example of a recent review of this spectacular episode of fraud, see James Titcomb, *Barings: The Collapse That Erased 232*

B. Traditional Banking Regulation

This is not to say that regulation therefore must also fail. For the entire period of bank regulation, the factor that has rendered prophylactic command-and-control regulation effective, or even possible at all, is discretion. Banking regulators wield large swaths of discretion in ways that are largely invisible to the public. For example, they are constantly monitoring loan-loss provisions by individual institutions and assessing whether these provisions are realistic in light of fluctuating economic conditions. They assess the adequacy of bank capital levels on an ongoing basis and evaluate whether these levels are sufficient in light of the portfolios of the specific institutions in question and the particular events and conditions they face—events and conditions that perpetually change as markets and external events change.[29] Apart from the amorphous nature of the phenomena that must be taken into account, it is also true that there have very seldom been sufficiently clear breaches of *law* for private suits to prevail. Where private suits have been successful, there have been provable breaches of clearly defined or well-settled law.[30]

Years of History, TELEGRAPH (Feb. 23, 2015, 6:00 AM), http://www.telegraph.co.uk/finance/newsbysector/banksandfinance/11427501/Barings-the-collapse-that-erased-232-years-of-history.html [https://perma.cc/U4DZ-5WSC].

29. Regulators maintain hundreds of full-time staff (field examiners) who work permanently on-site at most, if not all, of the big banks, and these supervisors spend their days ensuring, as far as they can, that banks comply with regulatory guidelines and rules. For an outline of the process, and the difference between regulation and supervision, see Thomas Eisenbach, David Lucca & Robert Townsend, *The Economics of Bank Supervision: So Much to Do, So Little Time*, FED. RES. BANK OF N.Y.: LIBERTY STREET ECON. (Apr. 12, 2016), http://libertystreeteconomics.newyorkfed.org/2016/04/the-economics-of-bank-supervision-so-much-to-do-so-little-time.html [https://perma.cc/C782-D76U]. *See also, e.g.*, Aaron Lucchetti, *The Regulator Down the Hall: Fed and Comptroller of the Currency Bolster the Banks of Staffers 'Embedded' at Nation's Biggest Banks*, WALL STREET J. (June 20, 2011), http://www.wsj.com/articles/SB10001424052702304763704576394610591065334 [https://perma.cc/PW8M-92FE] (providing both statistics and an illustrative graphic on the prevalence of this practice). Banks also have to file a wide range of reports on their activities, and these are monitored remotely for discrepancies and noncompliance. One example is the currency transaction report that must be filed whenever a payment transaction for more than $10,000 is made by a customer on any one business day; these reports are filed electronically and monitored by a federal government agency looking primarily for signs of criminality such as money laundering. *See, e.g.*, *Currency Transaction Reporting–Overview*, FED. FIN. INST. EXAM. COUNCIL: BANK SECRECY ACT/MONEY-LAUNDERING INFOBASE (2014), https://www.ffiec.gov/bsa_aml_infobase/pages_manual/OLM_017.htm [https://perma.cc/5G96-G99Q].

30. Nearly all suits are settled before trial, so the exact concessions by defendants are not usually disclosed, but for the suits to be brought at all they have to be based on some kind of alleged securities fraud. For example, JPMorgan Chase & Co. paid $4.5 billion to settle mortgage claims brought against it by a group of investors who alleged that JPMorgan's misrepresentations

The banking regulators are engaged with the industries they oversee in ways that are much deeper and more interactive than is the case with most other types of regulators.[31] They continuously monitor and supervise their charges, quite literally on a daily and even hourly basis, even evaluating the strategic business decisions made by a bank's management.[32] The authority that bank regulators wield is part of the quid pro quo for banks to receive certain benefits, including participation in the depositor guarantee system that we call federal deposit insurance (all banks), the benefits of a national charter (national banks), and the security of membership in the Federal Reserve (state member banks and all national banks). The bank regulators possess and exercise extensive chartering, visitation, and enforcement powers that require them to condition, observe, react to, and nudge daily bank operations.

One of the primary missions of a bank regulator is to prevent bank failure. This is known as "safety-and-soundness" supervision. Banks considered to be acting in unsafe or unsound ways, as well as those that have lapsed into conditions that are unsafe or unsound, are subject to intense scrutiny by government regulators. Banks constantly modify their operations in reaction to regulatory supervision and formal examinations. In the rare cases where they do not respond appropriately, recalcitrants are subject to the regulators' vigorous and very extensive enforcement powers.

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had caused them to buy instruments whose risks were not properly disclosed (that is, fraud). *See* Jessica Silver-Greenberg, *For JPMorgan, $4.5 Billion to Settle Mortgage Claims*, N.Y. TIMES DEALBOOK (Nov. 15, 2013, 6:20 PM), http://dealbook.nytimes.com/2013/11/15/jpmorgan-reaches-4-5-billion-settlement-with-investors [https://perma.cc/2Y4N-67Z3].

31. Market-conduct regulators such as the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), and the Consumer Financial Protection Bureau (CFPB) also have some "prudential" regulatory responsibilities, but these are much less significant than those discharged by the primary bank regulators. For an explanation of the broad visitorial powers of federal bank examiners, see *infra* note 34.

32. For a typical example of the kinds of factors taken into account by regulators, such as the ongoing concerns of the Office of the Comptroller of the Currency (OCC) regarding strategic risks and other risks undertaken by banks, see generally OFFICE OF THE COMPTROLLER OF THE CURRENCY, SEMIANNUAL RISK PERSPECTIVE FROM THE NATIONAL RISK COMMITTEE (Spring 2016), http://www.occ.gov/publications/publications-by-type/other-publications-reports/semiannual-risk-perspective/semiannual-risk-perspective-spring-2016.pdf [https://perma.cc/MMP7-9NNJ]. Since the S&L crisis, regulators have become much more intrusive in their assessments of managerial decisions by banks. *See generally* Lawrence G. Baxter, *The Rule of Too Much Law? The New Safety/Soundness Rulemaking Responsibilities of the Federal Banking Agencies*, 47 CONSUMER FIN. L.Q. REP. 210 (1993) (describing how intrusive the regulations promulgated in the wake of the S&L crisis had become).

This system was most memorably described by Justice Brennan in *United States v. Philadelphia National Bank*,[33] one of the great classics involving bank antitrust law. Justice Brennan viewed the system as a remarkable example of close interaction between the banks and the regulators who maintained the constant supervision of the banks and the health of the banking system.[34]

Notwithstanding the skepticism expressed so often nowadays, this system of supervisory regulation has, if anything, become significantly more intense. Large banks house hundreds of examiners from the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve on their premises, and a good deal of the monitoring takes place remotely via automated reporting, the filing of call and periodic reports, and information sharing among different regulatory agencies.[35]

II. PRUDENTIAL REGULATION VERSUS MARKET-CONDUCT REGULATION

Banks, in other words, are not only subject to the requirement that they abide by the law in these markets; they are also subject to

33. United States v. Phila. Nat'l Bank, 374 U.S. 321 (1963).

34. *See id.* at 329–30. Justice Brennan wrote:

> [P]erhaps the most effective weapon of federal regulation of banking is the broad visitorial power of federal bank examiners. Whenever the agencies deem it necessary, they may order "a thorough examination of all the affairs of the bank," whether it be a member of the [Federal Reserve] or a nonmember insured bank. Such examinations are frequent and intensive. In addition, the banks are required to furnish detailed periodic reports of their operations to the supervisory agencies. In this way the agencies maintain virtually a day-to-day surveillance of the American banking system. And should they discover unsound banking practices, they are equipped with a formidable array of sanctions. If in the judgment of the FRB [Federal Reserve Board] a member bank is making "undue use of bank credit," the Board may suspend the bank from the use of the credit facilities of the FRS [Federal Reserve]. The FDIC has an even more formidable power. If it finds "unsafe or unsound practices" in the conduct of the business of any insured bank, it may terminate the bank's insured status. Such involuntary termination severs the bank's membership in the FRS [Federal Reserve], if it is a state bank, and throws it into receivership if it is a national bank. . . . As a result of the existence of this panoply of sanctions, recommendations by the agencies concerning banking practices tend to be followed by bankers without the necessity of formal compliance proceedings.
>
> Federal supervision of banking has been called "[p]robably the outstanding example in the federal government of regulation of an entire industry through methods of supervision. . . . The system may be one of the most successful [systems of economic regulation], if not the most successful." To the efficacy of this system we may owe, in part, the virtual disappearance of bank failures from the American economic scene.

Id. (sixth and seventh alterations in original) (citations omitted) (first quoting 12 U.S.C. § 325 (2012), then quoting 12 U.S.C. § 301, then quoting 12 U.S.C. § 1818(a), then quoting 1 DAVIS, ADMINISTRATIVE LAW § 4.04 (1958)).

35. *See supra* note 29.

prudential regulation, which is distinct from (though often linked to) *market-conduct* regulation. Prudential regulation focuses on the wisdom of financial decisionmaking and management,[36] while market-conduct regulation focuses on whether markets are fair and whether participants are trying to cheat. Indeed, bank regulators are now officially referred to as "prudential regulators" to distinguish them from market regulators like the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC).[37] The convoluted legislative framework of financial regulation has generated some exceptions to this distinction, but as a general rule the distinction has become critical to modern banking regulation.

Safety-and-soundness regulation, however, introduces a unique component into the banking business. Whereas it is generally assumed that management, boards, and shareholders have a free hand in business so long as they refrain from violating external constraints expressed in laws and regulations, banks are monitored much more continuously and closely. Banks' actions are subject to persistent scrutiny through the process of regulatory supervision of their condition, their managers' conduct, and even certain decisions that might otherwise be thought of as business judgments.[38] When banks incline toward unsafe or unsound activities, or when they lapse into an unsafe or unsound condition—for example, when a bank allows its

36. *See generally* Vincent P. Polizatto, *Prudential Regulation and Banking Supervision: Building an Institutional Framework for Banks* 2 n.4 (World Bank Pol'y, Planning, and Research Complex, WPS 340, 1990), http://documents.worldbank.org/curated/en/389501468764981235/Prudential-regulation-and-banking-supervision-building-an-institutional-framework-for-Banks [https://perma.cc/B6PP-2G7P] ("Prudential regulation refers to the set of laws, rules, and regulations which is designed to minimize the risks banks assume and to ensure the safety and soundness of both individual institutions and the system as a whole. Examples include lending limits, minimum capital adequacy guidelines, liquidity ratios, etc."); *id.* at 4 ("Prudential regulations establish the outside limits and constraints placed on banks to ensure the safety and soundness of the banking system. They are the key elements to prevent, limit or stop the damage caused by poor management.").

37. For example, the Commodity Exchange Act specifically defines "prudential regulator" to encompass the banking regulators. Commodity Exchange Act § 1, 7 U.S.C. § 1a(39) (2012). Section 6b-1 of the Act allocates exclusive enforcement authority for most bank derivatives activities to the "prudential regulators," *id.* § 6b-1, and other provisions of the Act provide for special treatment by "prudential regulators" of banks' swap activity and minimum capital and margin variation requirements, *id.* §§ 6s(d)–(e), 6r.

38. In 1991, the Federal Deposit Insurance Corporation Improvement Act (FDICIA) significantly extended the safety-and-soundness powers of the prudential regulators, to the point that one might regard these powers as permitting regulators to intrude into the business judgments of banking institutions. Pub. L. No. 102-242, 105 Stat. 2236 (1991) (codified as amended at 12 U.S.C. § 1811). *See generally, e.g.*, Baxter, *supra* note 32 (discussing the intrusive nature of the FDICIA safety-and-soundness regulations).

capital or funding levels to drop below the point where it can recover from unexpected economic shocks or losses, or when a bank becomes vulnerable to sectoral downturns after concentrating its lending too heavily within a particular economic sector, as has been the case with the oil market over the past few years[39]—it is the job of regulators to nudge them back to soundness or, if these efforts are unsuccessful, to take increasingly formal enforcement action. These measures commonly occur throughout the life cycle of the bank.

Banks and their regulators are therefore locked in an interactive embrace as business decisions unfold. This is perhaps one of the reasons why "regulatory capture" assumes such significant dimensions in debates concerning banks—regulators are so closely involved that it often may be correct to assume that bank regulators are unduly influenced by their protégés.[40] This close involvement could also be the reason for so much public and political ire toward regulators, whom we instinctively feel should have prevented bank failure.

Yet it is this symbiotic relationship that renders bank mistakes so difficult to condemn. Not only must a litigant overcome the business judgment rule, which requires judicial deference toward management decisions made in good faith, but often she must also deal with the fact that much of what a bank has done has already been addressed and even condoned by its regulators. To this extent, there is a whiff of "indemnity" surrounding the actions of a bank.

Of course, this reality does not preempt condemnation of both banks and regulators for failing to prevent financial disasters. It is entirely understandable that we should accuse regulators of being asleep at the switch, bamboozled, or even captured. Additionally, to the extent that regulators cannot cover a substantial portion of bank management decisionmaking, we can also accuse banks of deceptive practices when not under the watchful eye of their supervisors, or charge them with having pulled the wool over regulatory eyes. But the

39. *See, e.g.*, Joint Press Release, Bd. of Governors of the Fed. Reserve, Fed. Deposit Ins. Corp. & Office of the Comptroller of the Currency (Nov. 5, 2015), http://www.federalreserve.gov/newsevents/press/bcreg/20151105a.htm [https://perma.cc/MF4X-JLQG] (expressing concern regarding greater risks posed to banks by the collapse in oil prices).

40. *See, e.g.*, Lawrence G. Baxter, *Capture in Financial Regulation: Can We Channel It Toward the Common Good?*, 21 CORNELL J.L. & PUB. POL'Y 175, 187 (2011) ("[T]he highly discretionary and continuous nature of bank regulation is dependent on and nurtures an environment in which the regulators and the regulated are engaged in such close, daily relationships as to nurture . . . codependence [that] might seem inevitably to lead to a mutual identification of interests and a manifestation of deep, if not surface, capture." (footnotes omitted)).

modality of safety-and-soundness supervision makes it extremely hard to establish provable violations of law.

This environment of safety-and-soundness regulation—or, as this is coming to be more commonly known, prudential regulation—should be clearly understood. Such regulation involves close interaction between banks and their supervisors, a constant series of difficult judgments on the part of both bankers and regulators, and a complex world of decisionmaking in which there is seldom one linear chain of events leading to financial loss. This explains why ad hoc, ex post private class action suits stand little chance of success in deterring bank failures or providing compensation when failures occur. It is also, one might submit, one of the reasons for public bewilderment at the lack of prosecutions of bankers: the public perception of banker wrongdoing likely tracks the market-conduct concept of "fraud" and "lawbreaking," and there were sufficient examples of such activities taking place to help generalize the perception to all things that went wrong with the banks and the financial system. The enforcement actions taken by the SEC and the CFTC, as well as the few successful class action suits, were both heavily based on concepts of market fraud, and thus might have helped promote the view that far more prosecutions ought to have been undertaken. In reality, actions based on variants of fraud might well have probed the outer limits of fruitful litigation.

III. DYNAMIC AND ADAPTIVE REGULATION

If traditional legal methods of reparation are inadequate, we are then left with the problem of preventing widespread banking failure and the damage such failure wreaks on interconnected institutions, the public, and the economy in general. The policy answers range from one extreme (pure market discipline) to the other (tight regulatory discipline or control). As a society, we have tended to choose a position somewhere in between. Yet we now find that this choice—a combination of market discipline and regulatory discipline—is hotly contested. Whereas for most of the period from the Banking Act of 1933 to the 2008 crisis the overall compromise between market and regulatory discipline had seemed reasonably satisfactory, the view that market and regulatory failures had "caused" the 2008 crisis led to two nearly irreconcilable solutions. One argued for intensified-market conduct, prudential regulation of individual financial institutions and general financial stability regulation, which are each among the major principles embodied in the Dodd-Frank Act.[41] The alternative advocated further deregulation, and was promoted by those who argued that faulty government intervention was the problem in the first place.[42]

Only the most extreme proponents of pure market discipline would take the view that government regulation has very little role to play.[43] Even leading bankers believe that the financial markets cannot operate properly without some degree of government regulation.[44] So, except where reduced to the level of the reality television of the 2016 presidential campaigns, the debates center around the *degree* of regulation, its *cost*, and how much of it is *effective* or, alternatively, *counterproductive*. Regulators and the adherents of intensified regulation rightly point out that for the stricter regulatory agenda to work, regulators need to be better resourced. Yet opponents of current and any increased levels of regulation point to many areas in which this regulation might be ineffective, counterproductive, or smothering in its compliance requirements. Nowhere does this seem to be more true than in the case of smaller banks, which lack the resources required to

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41. The intensification of prudential regulation was the central objective of Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. No. 111-203, 124 Stat. 1376 (codified in scattered titles of the U.S. Code). Dodd-Frank mandated a host of regulations designed to impose much closer scrutiny over banks by regulators. For a review of the numerous regulations mandated by the Dodd-Frank Act and progress in their implementation, see DAVIS POLK & WARDWELL LLP, DODD-FRANK PROGRESS REPORT (2016), https://www.davispolk.com/publications/dodd-frank-progress-report-six-year-anniversary [https://perma.cc/84SZ-UXKZ].

42. *See, e.g.*, JOHN A. ALLISON, THE FINANCIAL CRISIS AND THE FREE MARKET CURE: WHY PURE CAPITALISM IS THE WORLD'S ONLY HOPE (2012). Examples of government failures that are often cited are market distortions created by national housing policy; moral hazard associated with overbroad depositor protection; and monetary policies promoted by the Federal Reserve, such as unrealistically low interest rates, that led to the buildup of risk in the financial system and eventually to bubbles and crises.

43. After the 2008 crisis, a majority of the American public believes that we should regulate banks more, not less. *See, e.g.*, THE PEW RESEARCH CENTER FOR THE PEOPLE & THE PRESS, AUTO BAILOUT NOW BACKED, STIMULUS DIVISIVE 4 (2012) (indicating levels of support for current, less, and more regulation of banks). Underlying this aversion to governmental regulation is the strong belief that market discipline tends to be more effective. *See, e.g.*, John A. Allison, *Market Discipline Beats Regulatory Discipline*, 34 CATO J. 345, 345–48 (2014) (expressing skepticism at the intentions and effectiveness of governmental regulation of banks).

44. *See, e.g.*, Letter from Jamie Dimon, Chairman & Chief Exec. Officer, JPMorgan Chase & Co., to Shareholders 46 (Apr. 6, 2016), https://www.jpmorganchase.com/corporate/investor-relations/document/ar2015-ceolettershareholders.pdf [https://perma.cc/D2DQ-2QKC] ("By any reasonable measure, the financial system is unquestionably stronger [since the 2008 crisis], and regulators deserve a lot of credit for this. . . . Some people speak of regulation like it is a simple, binary tradeoff . . . . We believe that many times you can come up with regulations that . . . create a stronger system and enhance growth").

develop and maintain compliance platforms that can cope with the new regulatory regimes erected by the regulators in the wake of the passage of the Dodd-Frank Act.[45]

There is an even greater underlying problem that renders public-policy debates about better financial regulation somewhat sterile. We use models that have to some extent worked in the past in the traditional arena of market-conduct regulation, such as enforcing against easily proven violations of prophylactic rules stipulated in advance for appropriate market behavior. Yet this model has not had central relevance to the important mission of maintaining and promoting *safe and sound* conduct, as opposed to policing lawbreaking, which is essential for preserving the prosperity and stability of banking. It is true that banks are occasionally brought down by outright fraud or conduct so reckless that it is easily considered a violation of the rules—Barings Bank, destroyed by the bets placed by Nicholas Leeson, always comes to mind.[46] But the majority of financial difficulties caused by banks, or in which banks find themselves ensnared, are the result of a variety of factors other than fraud: bad business judgment (leading to unsafe and unsound financial conditions or conduct); sudden and unexpected "endogenous" events such as the collapse of certain industrial sectors (energy) or badly managed switches in central banking policy (for example, delinking the Swiss franc, Chinese government reversals in recent months, and the failure by the Board of Governors of the Federal Reserve System to raise interest rates at the proper time in the buildup to the 2008 crisis); major "macro trends" (for example, long-term interest-margin squeezes and disintermediation by nonbanks); and the surges of boom-and-bust cycles that banks find themselves unable to resist.[47] These are all features of the *complex adaptive* nature of financial markets, which are

45. *See, e.g.*, Marshall Lux & Robert Greene, *The State and Fate of Community Banking* 21–25 (Harv. Kennedy School Mossavar-Rahmi Ctr. for Bus. and Gov't, Working Paper No. 37, 2015), https://www.hks.harvard.edu/content/download/74695/1687293/version/1/file/Final_State_and_Fate_Lux_Greene.pdf [https://perma.cc/4PTF-44R7] (presenting an extensive economic study which found that regulatory burdens are falling particularly harshly on smaller banks).

46. On the Barings Bank collapse, see generally STEPHEN FAY, THE COLLAPSE OF BARINGS (1996). *See also supra* note 28.

47. The author of this Article is an adherent of the views of the late Hyman Minsky, who developed the "Instability Hypothesis" that demonstrates why boom-and-bust cycles are inherent to financial markets. Among Minsky's extensive work, the following is an excellent example of his contribution to the field: Hyman P. Minsky, *The Financial Instability Hypothesis* (Jerome Levy Econ. Inst. of Bard Coll., Working Paper No. 74, 1992), http://www.levyinstitute.org/pubs/wp74.pdf [https://perma.cc/X68V-C492].

themselves constantly labile and dynamic. Such features have always been inherent in financial markets.

If the markets inherently possess characteristics of complexity and dynamism, it is interesting that we only reached the point of bitter controversy over the past couple of decades. This Article presupposes that the reason for this recent discontent is that the major disagreements on bank regulatory policy are rooted in the buildup of formalism in enforcement powers and regulator–bank relationships, which began in reaction to the S&L crisis of the 1980s. Up to that point, banking regulators were able to interact with the financial markets and industries they regulated in a fairly dynamic and adaptive way. Safety-and-soundness regulation was highly discretionary, as banks operated within a relatively definable structure created by the banking legislation of the 1930s.[48] The notion of minimum capital itself only became a significant regulatory principle in the early 1980s.[49] Furthermore, banks were small enough, and their activities simple enough, for the task of "manual" supervisory regulation to be adequately staffed and discharged by the banking regulators.

As the scandals unearthed by the S&L crisis exploded in the late 1980s, it became apparent that all kinds of excesses had been permitted to savings-and-loan institutions by regulators who appeared underpowered, docile or complacent, or captured—in some cases all three.[50] Public anger at what was thought at the time to be a very

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48. The parent statute for the major banking reforms of the New Deal was the Banking Act of 1933, ch. 89, 48 Stat. 162. This statute introduced reforms such as federal deposit insurance, the Glass-Steagall wall between commercial and investment banking, and increased powers for regulators to enforce bank safety-and-soundness regulations. *See id.* For a convenient history, see Julia Maues, *Banking Act of 1933, Commonly Called Glass-Steagall*, FED. RES. HISTORY (Nov. 22, 2013), http://www.federalreservehistory.org/Events/DetailView/25 [https://perma.cc/DK2P-DSHC].

49. For example, the International Lending Supervision Act of 1983, Pub. L. No. 98-181, 97 Stat. 1278 (codified as amended at 12 U.S.C. §§ 3901–3911 (2012)), was partially enacted in response to a Fifth Circuit ruling that regulatory imposition of minimum capital requirements went beyond the regulator's powers. *See* First Nat'l Bank of Bellaire v. Comptroller of the Currency, 697 F.2d 674, 687 (5th Cir. 1983).

50. Vivid expressions of congressional dissatisfaction with the performance of the regulators occurred during both the S&L crisis and the 2008 crisis. In 1989, Congress abolished the old Federal Home Loan Bank Board and its deposit insurance arm, supplanting the regulatory functions over thrift institutions into a new agency within the Treasury Department called the Office of Thrift Supervision (OTS) and the insurance functions within the FDIC. *See The S&L Crisis: A Chrono-Bibliography*, FED. DEPOSIT INS. CORP., https://www.fdic.gov/bank/historical/sandl/ [https://perma.cc/P44N-H9R9] (offering a chronology of events during the S&L crisis and the legislative aftermath). The continuing ineffectiveness of the OTS, particularly in its failure to provide adequate supervision over the thrift subsidiary of AIG, led to its own abolition and the

sizeable bailout led to strong reactions in Congress, which passed a succession of statutes that intensified and formalized the enforcement powers of the banking regulators and also criminalized many more financial activities.[51]

Although this reaction might have been politically appropriate, it had the effect of formalizing the relationship between regulators and the industry. What had long been a flexible and deliberative relationship between banks and their regulators, very seldom rising to the level of actual enforcement action against a bank and almost never becoming a public issue, became one in which regulators possessed and in some cases were specifically required to exercise very far-reaching powers. Many bank executives were sent to federal prison,[52] and the overall regulatory modus vivendi acquired a stronger adversarial tinge.

To a certain extent, regulatory *discretion* has become a notion deeply mistrusted in a Congress to which the regulators must in turn answer if anything goes wrong.[53] These trends, combined with various

transfer of its functions to the OCC under the Dodd-Frank Act. For a chronology of events during the 2008 crisis and the legislative aftermath, see *Events*, FED. RESERVE HISTORY, http://www.federalreservehistory.org/Events/Graphicalview/15 [http://perma.cc/5J45-2HEP] and the links cited therein.

51. FIRREA, Pub. L. No. 101-73, 103 Stat. 183 (codified as amended at 12 U.S.C. § 1811 (2012)); Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991, Pub. L. No. 102-242, 105 Stat. 2236 (codified in scattered sections of 12 U.S.C.) (including PCA); Annunzio-Wylie Money Laundering Act, Pub. L. No. 102-550, 106 Stat. 3672 (1992) (codified in scattered sections of 12 U.S.C.); Crime Control Act of 1990, Pub. L. No. 101-647, 104 Stat. 4789 (codified in scattered sections of 18 U.S.C.); USA PATRIOT Act, Pub. L. No. 107-56, 115 Stat. 272 (2001) (codified in scattered sections of 12, 18, 20, 31, 42, 47, 49, 50 U.S.C.). The Dodd-Frank Act further extended the enforcement powers of the financial regulators. For example, the SEC was given additional authority to impose civil money penalties in cease-and-desist proceedings, Dodd-Frank § 929P (amending § 8A of the Securities Act, § 21B(a) of the Securities Exchange Act, § 9(d)(1) of the Investment Company Act, and § 203(i)(1) of the Investment Advisers Act), and the OCC was given extended visitorial powers over national banks by section 1047 of the Dodd-Frank Act (amending § 5136C of the National Building Act).

52. *See, e.g.*, Joshua Holland, *Hundreds of Wall Street Execs Went to Prison During the Last Fraud-Fueled Bank Crisis*, MOYERS & CO. (Sept. 17, 2013), http://billmoyers.com/2013/09/17/hundreds-of-wall-street-execs-went-to-prison-during-the-last-fraud-fueled-bank-crisis/ [https://perma.cc/Y8F9-C724] (interviewing one of the leading prosecutors involved at the time).

53. A view of the supposed evils of regulatory discretion is held by some in the markets. For example, see prominent blogger Steve Randy Waldman's observation (accompanied by serious argument) that "[an] enduring truth about financial regulation is this: [g]iven the discretion to do so, financial regulators will always do the wrong thing." *Discretion and Financial Regulation*, INTERFLUIDITY (Nov. 16, 2009, 3:15 AM), http://www.interfluidity.com/posts/1258156478.shtml [https://perma.cc/T4MC-GWGH]. Of course, the overall reasons for regulatory failure are much more complex than an incapacity on the part of regulators to make good decisions. *See generally, e.g.*, PETER H. SCHUCK, WHY GOVERNMENT FAILS SO OFTEN (2014) (explaining that deep structural factors are to blame for government failure, rather than which party is in charge).

economic misfortunes, have tended to pit industry and regulators against each other—a model simply incompatible with the requirements of ever-changing, fast-moving, and often volatile markets. Moreover, the evolving adversarial model has demanded resources on the part of the regulators, resources that Congress has been reluctant to provide. For example, the SEC and the CFTC were given a large range of new mandates to regulate the financial markets,[54] yet their budgets were not correspondingly increased to match these new demands.[55] It is true that the prudential regulators largely fund themselves through the fees imposed on their industries, but even raising these imposts has served further to fracture cooperation between regulators and their banks.

So we have drifted far from the kind of regulatory model that can be productive and viewed in a positive light by both the industry and the public. To regulate modern markets effectively, regulators must be able to exercise broad discretion when deciding whether to intervene to stop certain activities deemed potentially dangerous to the institution in question. They require regulators who can keep pace with the markets and apply meaningful, continuous supervision. And they require sophisticated technology to match the demands of modern banking. Simply prohibiting activities, a strategy that has been advocated by those who blame "innovation" as a cause of the 2008

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54. Investor Protection and Securities Reform Act of 2010, Pub. L. No 11–203, 124 Stat. 1822 (codified at 15 U.S.C. § 921 (2012)) (Dodd-Frank Act, Title IX) (conferring extensive new enforcement powers on the SEC and the CFTC).

55. *See, e.g.*, Stewart Bishop, *GOP Senate Spells Tight Budgets for SEC, CFTC*, LAW360 (Nov. 5, 2014), http://www.law360.com/articles/591224/gop-senate-spells-tight-budgets-for-sec-cftc [http://perma.cc/9C74-U4TZ] (describing the refusal of the Senate, then newly controlled by the Republican Party, to provide adequate funding for the CFTC and the SEC); Richard Hill, *SEC, CFTC Funding Flat in Senate Bill*, BLOOMBERG BNA (June 16, 2016), http://www.bna.com/sec-cftc-funding-n57982074254 [https://perma.cc/9MZE-KZMD] (describing the flat funding by the Senate Appropriations Committee for fiscal year 2017, despite White House requests for increases to cope with new burdens imposed on these agencies). The CFPB has received special treatment in that its budget has been tied to revenue derived by the Federal Reserve. Nonetheless, the GOP-controlled Congress, with strong industry support, has repeatedly tried to change this funding mechanism to reduce the amount of funding the CFPB receives. For a recent example, see Ian McKendry, *House Spending Bill Includes Big Changes to CFPB*, AM. BANKER (July 8, 2016), http://www.americanbanker.com/news/law-regulation/house-spending-bill-includes-big-changes-to-cfpb-1090107-1.html [http://perma.cc/G88M-5EWF] (reporting on a spending bill approved by the House, which would fundamentally restructure the CFPB and change its funding—interpreted by the opposition as an attack on the effectiveness of the CFPB).

crisis,[56] is not an option: just as water will always find a way around barriers, such innovation would simply move almost instantly to the shadow banking arena, where there is even less supervision and an even lesser chance of such supervision being effective.[57] Finally, structural reforms that would segregate segments of the financial industry along the lines of the Glass-Steagall Act[58] can only go so far in preventing interconnections between these segments. The interconnections themselves continue to require some kind of supervision.[59] What is required for effective prudential supervision is a regulatory framework that is capable of rapid adaptation, that is genuinely feasible in the hands of budget-constrained regulators, and that automates data and compliance monitoring so that important matters entailing expert discretionary judgment can be isolated, subjected to dedicated regulatory assessment, and, where necessary, subjected to further action.

We talk and act, however, in terms that do not fit this dynamic nature of markets. We use and promote prophylactic rules that fail to recognize the labile nature of matters that must be regulated. The

56. *See, e.g.*, Simon Johnson & James Kwak, *Finance: Before the Next Meltdown*, 14 DEM. J., Fall 2009, http://democracyjournal.org/magazine/14/finance-before-the-next-meltdown [https://perma.cc/3TY3-34F9] ("[F]inancial innovation stands accused of being complicit in the financial crisis that has created the first global recession in decades."). The literature on whether and how financial innovation contributed to the 2008 crisis is vast. *See, e.g.*, Thorsten Beck, Tao Che, Chen Lin & Frank M. Song, *Financial Innovation: The Bright and the Dark Sides* (Jan. 2014), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1991216&rec=1&srcabs=1986922&alg=1&pos=5 [https://perma.cc/6QPS-WBA2].

57. Some scholars have attempted to develop a framework along the lines of the Food and Drug Administration's drug-approved process for approving "innovative" banking products. *E.g.*, Saule T. Omarova, *License to Deal: Mandatory Approval of Complex Financial Products*, 90 WASH. U. L. REV. 63, 90–93 (2012); Eric A. Posner & E. Glen Weyl, *An FDA for Financial Innovation: Applying the Insurable Interest Doctrine to Twenty-First-Century Financial Markets*, 107 NW. U. L. REV. 1307, 1348–56 (2013). These thoughtful attempts seem quaintly out of touch with the nature of modern financial markets; they seem highly unlikely to be adopted by policy makers, and the efforts to restrict innovation would likely project a similar departure to the shadow markets.

58. The Glass-Steagall Act was a principal component of the Banking Act of 1933. Among other provisions, four key sections (sections 16, 20, 21, and 32) severely restricted the ability of banks to engage in securities underwriting, Banking Act of 1933 § 16, 12 U.S.C. § 24 (2012), forbade affiliation between commercial banks and investment banks, Banking Act of 1933 § 20, 48 Stat. 162 (repealed 1999); Banking Act of 1933 § 21, 12 U.S.C. § 378, and prohibited bank directors and management from also performing such functions on investment banks, and vice versa, Banking Act of 1933 § 32, 48 Stat. 162 (repealed 1999).

59. A prominent former regulator has made this point again very recently. *See* Eugene Ludwig, *Unregulated Shadow Banks Are a Ticking Time Bomb*, AM. BANKER (Mar. 15, 2016), http://www.americanbanker.com/bankthink/unregulated-shadow-banks-are-a-ticking-time-bomb-1079892-1.html [https://perma.cc/RV5Z-Z3E2].

circumstances facing financial institutions change constantly. When an industrial sector suddenly encounters difficulties, the complexion of a bank's portfolio can change almost overnight. Without extensive discretion, management (let alone regulators) cannot adapt quickly to reposition and adjust. Except at the most abstract levels, it is difficult to provide regulatory guidance in advance. Prophylactic rules quickly become part of the problem themselves, either because they lose their initial suitability to market conditions or because they are easily circumvented to the extent that they form *target regulation*, around which any rational actor would quickly adapt.[60] It is said that "markets demand certainty," yet markets are never certain for long. We accuse regulators of having "abdicated" their responsibilities by, for example, validating bank risk models instead of creating their own direct supervisory models.[61] And new permutations of bankers and third parties, using highly advanced algorithmic tools,[62] are presenting even greater challenges. These cannot be ignored by regulators, yet to address the challenges such models present requires an entirely new mindset and lab-like experimentation. If we continue to assume a command-and-control model of regulation, we cannot hope to produce a regulatory capacity capable of meeting the need for supervision and oversight of modern financial markets. In short, we need to think in terms of *dynamic regulation* when it comes to the safety of our financial institutions and the stability of the financial system itself.

This is not to suggest that market-conduct regulation and victims' market-conduct class action suits are ineffective or irrelevant. But such mechanisms only police the *miscreants* of the market. Notwithstanding emotive labels ("banksters," for example), it seems reasonable to

60. For a discussion of Goodhart's Law, see *supra* note 20 and accompanying text.

61. *See, e.g.*, IMAD A. MOOSA, THE MYTH OF TOO BIG TO FAIL 88 (2010) (suggesting that regulators relied too heavily on the ratings agencies instead of making their own assessments); Kenneth A. Bamberger, *Technologies of Compliance: Risk and Regulation in a Digital Age*, 88 TEX. L. REV. 669, 677–78 (2010) (describing the difficulty of regulating financial risks); Baxter, *supra* note 15, at 839–41 (describing the impact of regulatory reliance on bank risk-management models); Erik F. Gerding, *Code, Crash, and Open Source: The Outsourcing of Financial Regulation to Risk Models and the Global Financial Crisis*, 84 WASH. L. REV. 127, 129–34 (2009) (arguing that regulatory reliance on bank risk modeling was in effect an abdication of regulatory responsibility).

62. The field of algorithmic finance, which is essentially computer-driven financial activity, is already vast, covering such fields as statistical arbitrage strategies, high-frequency trading, agent-based finance, and machine learning. *See, e.g.*, ALGORITHMIC FINANCE, http://algorithmicfinance.org [https://perma.cc/PY7S-BVRU]. The academic journal *Algorithmic Finance* is devoted to publishing academic articles on the subject, and it maintains archives. *See id.* (follow "archive on SSRN.com" hyperlink under "Archives" heading on right-side column).

assume that most bankers, perhaps the vast majority, are trying to do the right thing just like everybody else.[63] Market-conduct defalcations require punishment, not only to provide compensation to victims but also to send signals to the market as to the boundaries of acceptable conduct. Prudential regulation, however, is a very different enterprise not easily amenable to or effective in the use of punitive tools, except where market participants simply refuse to conform to reasonable supervisory requirements. It is for these purposes that we must continue to develop a more appropriate model of dynamic financial regulation.

A. Avenues of Development

Notwithstanding the misgivings that many experts have about the efficacy of the reforms introduced by the Dodd-Frank Act[64] and the many years of its subsequent regulatory implementation,[65] a good case can be made that the legislation and its regulations readjusted the focus of government regulation in various desirable directions. Indeed, a failure by regulators to make such adjustments is itself creating great perils.[66]

First, the systemic framework within which the health of banks and overall financial stability must be preserved has been elevated in importance. Title I of the Dodd-Frank Act[67] created a new Financial Stability Oversight Council (FSOC) and a research agency, the Office of Financial Research (OFR).[68] The purpose of these reforms was to

63. The shocking Wells Fargo fraud scandal, in which two million fraudulent accounts were opened, five thousand employees were fired, and the CEO was forced to retire, might suggest otherwise, yet even that example would seem to be the exception that proves the rule, and it would certainly be wrong to accuse the large majority of Wells Fargo bankers of fraud. *See, e.g.*, Renae Merie, *Wells Fargo CEO Steps Down in Wake of Sham Accounts Scandal*, WASH. POST (Oct. 12, 2016), https://www.washingtonpost.com/news/business/wp/2016/10/12/wells-fargo-ceo-to-retire-in-wake-of-sham-accounts-scandal [https://perma.cc/RY62-MHXF] (reviewing the scandal and its consequences).

64. Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, Pub. L. No. 111-203, 124 Stat. 1376 (codified in scattered titles of the U.S. Code).

65. *See* DAVIS POLK & WARDWELL LLP, *supra* note 41.

66. *See* Bamberger, *supra* note 61, at 677–97 (describing compliance's dependence on technology itself, which in turn creates all kinds of perils, effectively transferring monitoring and the interpretation of compliance adequacy from regulators to programmers within the financial institutions themselves).

67. Financial Stability Act of 2010, 12 U.S.C. §§ 5311–5374 (2012).

68. Dodd-Frank § 111, 12 U.S.C. § 5321 (creating the FSOC); *id.* § 152, 12 U.S.C. § 5342 (creating the OFR). The Federal Reserve Board had also created a new committee called the Office of Financial Stability Policy and Research (OFSPR), now the Division of Financial

understand better the dynamics of the financial markets as a whole and the areas from which instability might evolve. The FSOC has the power to designate nonbank financial institutions, including financial-market utilities such as exchanges and clearinghouses, as systemically important financial institutions (SIFIs), subject to increased capital and other regulatory requirements.[69] The statute itself also identifies a whole class of big banks as systemically important banks (SIBs).[70]

Second, the Dodd-Frank Act intensified the level of regulation to which SIFIs, bank holding companies, foreign banking organizations, and nonbank SIFIs are now subject.[71] The regulatory powers of the prudential agencies, in particular the Federal Reserve, were substantially enhanced so that macroprudential (systemic) and

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Stability, to coordinate its significant research resources. These entities (the FSOC, OFR, and OFSPR) are all designed to gather better economic data concerning potential areas of financial instability, and to provide better analysis of what this data signifies and where the trends in financial threats are heading. *See, e.g.*, *About the OFR*, OFFICE OF FIN. RESEARCH, https://financialresearch.gov/about/ [https://perma.cc/7KSP-ETKS] (describing and reporting on the functions of the OFR); *Financial Stability Oversight Council*, U.S. DEPT. OF THE TREASURY, https://www.treasury.gov/initiatives/fsoc/about/Pages/default.aspx [https://perma.cc/UB3K-NFZ9] (describing the structure and functions of the FSOC); *The Economists: Financial Stability*, BD. OF GOVERNORS OF THE FED. RES. SYS., http://www.federalreserve.gov/econresdata/fsprstaff.htm [https://perma.cc/6YPN-2PM6] (describing functions of and personnel in the division).

69. The enhanced regulatory requirements are contained in Titles I and III of the Dodd-Frank Act. Section 165 of the Act requires the Federal Reserve Board to promulgate regulations for enhanced prudential supervision, including the application of strict liquidity, risk management, and capital standards, of and to large U.S. bank holding companies and foreign banking organizations. Dodd-Frank Act § 165, 12 U.S.C. § 5365. These regulations were promulgated in a final rule in early 2014. Enhanced Prudential Standards for Bank Holding Companies and Foreign Banking Organizations (Regulation YY), 79 Fed. Reg. 17240 (codified at 12 C.F.R. pt. 252 (2015)); *see also* Press Release, Bd. of Governors of the Fed. Reserve Sys. (Feb. 18, 2014), https://www.federalreserve.gov/newsevents/press/bcreg/20140218a.htm [https://perma.cc/EHY9-FWJV] (providing a convenient outline of the contents of the very complex and lengthy rule). In addition to the enhanced regulation of large holding companies, banks above a certain asset size are subject to direct enhanced regulation by their primary regulators, for example the OCC. Federal Deposit Insurance Act § 39, 12 U.S.C. § 1831p-1 (2012) (as amended by FDICIA, Pub. L. No. 102-242, § 132, 105 Stat. 2236, 2267–2270). For the OCC's rules, see OFFICE OF THE COMPTROLLER OF THE CURRENCY, OCC BULL. NO. 2014-45, HEIGHTENED STANDARDS FOR LARGE BANKS: INTEGRATION OF 12 CFR 30 AND 12 CFR 170 (Sept. 25, 2014), http://www.occ.gov/news-issuances/bulletins/2014/bulletin-2014-45.html [https://perma.cc/FF33-C9VQ].

70. Dodd-Frank Act § 165(a)–(b), 12 U.S.C. § 5365(a)–(b) (requiring more stringent standards of supervision for banks and bank holding companies with total consolidated assets of $50 billion or more).

71. *Id.* §§ 161–176 (codified in scattered sections of 12 and 15 U.S.C.).

microprudential (safety-and-soundness)[72] issues are under more comprehensive surveillance by the banking regulators.

Finally, the FDIC and the Federal Reserve were given much more extensive powers over banking organizations and, potentially, nonbanking organizations. They may now require forward planning on the part of these organizations for situations of instability and possible eventual failure ("orderly resolution plans" or "living wills"), and they may also require rapid resolution in the event of failure on the part of a particular financial institution.[73]

Reforms were also directed toward market conduct and the visibility of market activities. Among many other reforms, the SEC and the CFTC obtained extensive new powers to regulate the over-the-counter derivatives market and its key institutions,[74] while the newly created CFPB[75] acquired extensive powers to regulate "unfair, deceptive, or abusive" financial practices involving consumers.[76] These reforms, involving better disclosures, tighter rules regarding counterparties and borrowers, and much more extensive reporting, are significant extensions of the general and long-standing principles of market regulation. Apart from violations of the relevant laws and regulations, however, the extended framework of market regulation continues to be aimed at market abuse, not preventing the failure of the financial system itself.

All of the measures just described—systemic-risk regulation, enhanced regulation of individual institutions, and market transparency and fairness regulation—were designed to strengthen

72. Macroprudential regulation focuses on the *systemic* elements of financial stability: for example, how financial institutions interact with each other, how macroeconomic trends affect the stability of financial institutions, and how financial institutions can affect overall financial stability. Microprudential regulation focuses on the soundness, management, and financial health of individual institutions.

73. Dodd-Frank Act §§ 201–217 (codified at 12 U.S.C. §§ 5381–5394).

74. *Id.* §§ 701–74 (codified in scattered sections of 7 and 15 U.S.C.).

75. *Id.* §§ 1001–1100H (codified in scattered sections of 5, 12, and 15 U.S.C.). The supervision and minimum requirements of many banking activities were also substantially strengthened, including: investing, *id.* §§ 901–91 (codified in scattered sections of the U.S. Code), engagement with private equity and hedge funds, *id.* § 619 (codified at 12 U.S.C. § 1851 and known as the "Volcker Rule"), and granting mortgages, *id.* §§ 1400–1498 (codified in scattered sections of the U.S. Code).

76. The CFPB was made the primary enforcing agency for these purposes. *Id.* § 1031(a)–(b), 12 U.S.C. § 5531(a)–(b); *see also id.* § 1021, 12 U.S.C. § 5511 (protecting consumers from "unfair, deceptive, or abusive acts and practices and from discrimination"); *id.* § 1031(b)–(d), 12 U.S.C. § 5531(b)–(d) (defining "unfair, deceptive or abusive acts or practices" and authorizing rulemaking for further definition).

macroprudential and microprudential regulatory powers. In other words, they were designed to promote financial stability in general, and bank safety and soundness in particular, to avert a significant bank failure or another crisis, the source of so much damage to consumers. The strengthened disclosure and governance regimes of market-conduct regulation were also designed to enlist the discipline of the market to complement the oversight of regulators. Market and regulatory discipline would combine to preserve honest and stable finance.

Herein lies a dilemma: just as markets fail for various reasons, including information asymmetry,[77] agency problems,[78] and moral hazard,[79] so too do regulations. This failure can occur by reason of capture; because of insufficient resources and conflicting missions; and, most importantly for present purposes, because the regulatory model struggles to keep pace with the ever-changing marketplace. Despite all the developments in nearly a century, our regulatory model—and indeed, Congress itself—continues to presuppose a relatively static ecology that can be regulated, disciplined, and punished according to command-and-control techniques. Chief among these techniques are prescribing rules of conduct and condition in advance; requiring regulatory surveillance for compliance with these rules; and dictating ensuing regulatory action, ranging from mild enforcement to outright seizure of institutions,[80] when it becomes evident that an institution has not or will not comply. This model appeals to the normative ideal of the rule of law, and it appears to be mitigated by conferring discretion on regulators who know when they should act mildly or harshly. But it does not work well anymore.

77. Information asymmetry occurs when one party lacks the same quality or degree of information as its counterparty and is therefore unable to bargain on equal terms.

78. Market failures caused by agency problems occur when management pursues objectives that are not necessarily the same as those of the institution's shareholders or not necessarily for their benefit.

79. Moral hazard, a concept well known in insurance, exists where the risks and costs of a particular action are borne by someone other than the actor, leading the actor to take undue risks because she or the institution will not have to pay for the costs of errors. Financial regulation is riddled with moral hazard problems, the most well known of which is the notion of "too-big-to-fail" institutions that will be kept alive no matter how incompetent because the general public or taxpayers would have to bear the cost of their failure. *See supra* note 61.

80. Under the "prompt corrective action" system, regulators can seize an institution while it is still technically solvent but its capital has fallen below a threshold level of two percent. *See* 12 U.S.C. § 1831o(h)(3) (2012) (authorizing the responsible agency to place a critically undercapitalized institution into conservatorship or receivership).

First, as already discussed, markets are highly dynamic, labile, and adaptive.[81] Rules and reforms are quickly outdated. Indeed, they are sometimes downright iatrogenic: new rules designed to fix one problem might well create a host of new problems.[82] Old rules that were based in long-forgotten good sense can be swept away before their value is fully appreciated.[83] And target-based regulation is often self-defeating for the simple reason that market participants quickly and rationally adjust their behavior around the "certainty" created by the new targets.[84]

To cope with the demands of regulating financial markets, it seems that, more than ever, greater emphasis must be placed on developing forms of "adaptive regulation," as opposed to command-and-control regulation. The concept of adaptive regulation is evolving as a new field of exploration in administrative law,[85] yet in some ways for financial regulation it would also constitute a return to, albeit requiring substantial modernization of, bank safety-and-soundness regulation.[86]

Second, because of the increasing formalization of our regulatory framework and the escalating, politically attractive yet ineffective from

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81. *See supra* Part I.A.

82. *See* Jonathan B. Wiener, *Managing the Iatrogenic Risks of Risk Management*, 9 RISK: HEALTH, SAFETY & ENV'T 39, 40–41 (1998) (providing examples of regulations aimed at curbing risk that may create additional risks). This phenomenon is sometimes known as the "Cobra Effect."

83. This is sometimes referred to as the "paradox of Chesterton's Fence," after an observation in the great author G.K. Chesterton's 1929 book, THE THING:

> In the matter of reforming things, as distinct from deforming them, there is one plain and simple principle; a principle which will probably be called a paradox. There exists in such a case a certain institution or law; let us say, for the sake of simplicity, a fence or gate erected across a road. The more modern type of reformer goes gaily up to it and says, "I don't see the use of this; let us clear it away." To which the more intelligent type of reformer will do well to answer: "If you don't see the use of it, I certainly won't let you clear it away. Go away and think. Then, when you can come back and tell me that you *do* see the use of it, I may allow you to destroy it."

G.K. CHESTERTON, THE THING 35 (Sheed & Ward 1957) (1929).

84. For a discussion of Goodhart's Law, see *supra* note 20.

85. *See generally* Lawrence G. Baxter, *Adaptive Regulation in the Amoral Bazaar*, 128 S. AFR. L.J. 253 (2011) (arguing that conceptual frameworks for regulating complex markets are moving away from directive models in favor of adaptive approaches); Lawrence E. McCray, Kenneth A. Oye & Arthur C. Petersen, *Planned Adaptation in Risk Regulation: An Initial Survey of US Environmental, Health, and Safety Regulation*, 77 TECH. FORECASTING & SOC. CHANGE 951 (2010) (surveying U.S. federal regulatory programs concerning the environment, health, and safety to ascertain which ones have included adaptive features); Jonathan B. Wiener, *Better Regulation in Europe*, 59 CURRENT LEGAL PROBS. 447 (2006) (suggesting that regulatory reforms in Europe should place greater emphasis on ex post evaluation and adaptive management).

86. For a discussion of flexible safety-and-soundness regulation, see *supra* note 34 and accompanying text.

a regulatory point of view, reliance by Congress on command-and-control edicts, financial regulation has become highly adversarial.[87] Whereas in an older time a concern on the part of a regulator might be worked out informally with the financial institution concerned long before trouble arose, our modern distrust of regulatory discretion, coupled with the severe consequences of enforcement and the increasing power of financial institutions, often results in politically polarized clashes between industry and regulators, on the one hand, and between partisans on relevant congressional committees, on the other. The consequences are generally not productive.

B. *What Might Dynamic Financial Regulation Look Like?*

The dyspeptic condition of modern financial regulation suggests a need for some substantially new approaches. Identifying such possibilities involves understanding financial markets as complex adaptive systems containing fragile strata, exhibiting constant evolution, and requiring multidisciplinary approaches to their maintenance.[88] Viewed from this perspective, command-and-control rules are no more than skeletal restraints. Regulators require considerable ongoing discretion. Equally importantly, they need resources similar to (though not necessarily in the same *quantity* as) those being used by the agents within the markets themselves. Under this view, the regulators are *also market agents*. It is for this reason that adaptive regulation has such an important role to play and command-and-control regulation is so often ineffective. One of the major U.S. market regulators, the CFTC, has itself recognized the need to rethink financial regulation, emphasizing principles-based approaches, to meet the demands of technology-driven financial markets.[89]

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87. For concrete examples of this growing formalism, see *supra* note 51 and accompanying text.

88. For a discussion of the application of complexity science to financial regulation, see *supra* note 15 and accompanying text.

89. *See, e.g.*, J. Christopher Giancarlo, Comm'r, Commodities Futures Trading Comm'n, Keynote Address Before the Cato Institute's Conference on Cryptocurrency: The Policy Challenges of Decentralized Revolution (Apr. 12, 2016), http://www.cftc.gov/PressRoom/SpeechesTestimony/opagiancarlo-14 [https://perma.cc/M27R-SE9W] (emphasizing the need for global coordination by regulators, who should "create a principles-based approach" and take a "pragmatic and flexible approach" to the regulation of new technologies (quoting Masamichi Kono, Financial Services Agency, Japan, Remarks at CFTC International Regulators' Meeting (Mar. 15, 2016), http://www.fsa.go.jp/common/conference/danwa/20160315/01.pdf [https://perma.cc/956D-WXKP])); Timothy Massad, Chairman, Commodities Futures Trading Comm'n, Keynote Address Before the World Federation of Exchanges Annual Meeting, Doha, Qatar (Oct. 19, 2015), http://www.cftc.gov/PressRoom/SpeechesTestimony/opamassad-29 [https://perma.cc/

Apart from the obvious need to respond to recent developments in technology, there is nothing new in an argument for greater regulatory discretion in financial regulation. Principles-based (as opposed to rules-based) regulation, which recognizes the importance of continuing discretion for regulatory supervision, has long been the focus of debates on optimal regulation.[90] The recognition that *cycles* generate crises has led regulators to think in terms of *countercyclical* regulation, such as capital "buffers" and contingent convertible bonds[91] that morph from debt into equity as circumstances change.[92] Turning to the arena in which we have seen the biggest impact of technology, Pillar 2 of both Basel II and Basel III[93] represent an attempt by regulators to adapt to highly advanced and perpetually evolving

2PHS-V7ES] (calling for domestic and global market regulators to consider ways to transform regulatory oversight in light of technological innovation and market transformation).

90. *See generally* JULIA BLACK, RULES AND REGULATORS (1997) (offering an analysis of the relationship between rules and rulemaking and the regulatory process, with a special focus on financial-services regulation); Julia Black, *Forms and Paradoxes of Principles-Based Regulation*, 3 CAP. MKTS. L. REV. 425 (2008) (exploring different forms of principles-based regulation and comparing this regulatory strategy's strengths and weaknesses to those of traditional rules-based regulation). For an example in the specific context of banking regulation, see Steven L. Schwarcz, *The 'Principles' Paradox*, 10 EUR. BUS. ORG. L. REV. 175, 176 (2009) (arguing that the efficacy of principles-based regulation versus rules-based regulation is influenced by the type of enforcement regime).

91. Contingent convertible bonds are bonds that only convert to equity upon the contingency of a specified event such as the stock price of a company breaking through a predetermined price. They are used in financial services to convert bondholders to equity holders when capital falls below desired levels, thereby eliminating the debtholder status of the owners of the bonds and strengthening the equity at stake. *See, e.g.*, *Definition of Cocos*, FIN. TIMES, http://lexicon.ft.com/Term?term=cocos [https://perma.cc/F5YS-LWRX].

92. Countercyclical regulation is designed to impose protective burdens, such as higher capital requirements, on financial institutions when they and the economy are doing well or, in the case of debtholders, to require the conversion of their debt into equity once an institution falls below required capital levels so that debtholders share in the losses alongside equity holders. The idea is that when an institution gets into trouble or the economy turns bad it is too late to impose such burdens because this will only make things worse for the institution. *See generally, e.g.*, Patricia A. McCoy, *Countercyclical Regulation and Its Challenges*, 47 ARIZ. ST. L.J. 1181 (2016) (reviewing the mechanisms of, and tradeoffs resulting from, countercyclical regulation).

93. Pillar 2 of Basel II and Basel III is the supervisory review process articulated in the two major international standards of banking supervision. For an initial description, see BASEL COMM. ON BANKING SUPERVISION, PT. 3: THE SECOND PILLAR—SUPERVISORY REVIEW PROCESS 204–42, https://www.bis.org/publ/bcbs128c.pdf [https://perma.cc/9DEV-XGFZ]. This document has been superseded by ever more elaborations of the Basel framework. Basel II was introduced in the early 1990s as a more sophisticated framework for managing risk, assessing capital adequacy, and ensuring consistency in regulatory supervision across the globe. When Basel II proved inadequate in preventing the 2008 crisis, the Basel Committee set about creating more refined standards, now contained in a complex and convoluted mélange of documents under the rubric of Basel III. *See Basel III: International Regulatory Frameworks for Banks*, BANK FOR INT'L SETTLEMENTS, http://www.bis.org/bcbs/basel3.htm [https://perma.cc/U5AS-2RGJ].

models of risk management.[94] And modern capital stress testing is becoming more dynamic.[95] Indeed, one commentator postulates that stress testing is effectively displacing traditional safety-and-soundness supervision.[96]

Quick reflection, however, would reveal that requiring regulators to be endowed with such tools is a very tall order. The scale, operations, and complexity of modern financial institutions and even the markets themselves are immense.[97] Manual surveillance of automated activities, for example, is entirely unrealistic, and the automation of many of the regulatory tasks traditionally performed manually seems imperative. Indeed, one leading administrative lawyer has opined that "Robot Regulators Could Eliminate Human Error,"[98] and for many aspects of monitoring, he might well be right.

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94. Basel II was the primary international standard for bank regulation. Although not mandatory within jurisdictions, regulators, including those within the United States, based their regulation of large banks on these standards. *See History of the Basel Committee*, BANK FOR INT'L SETTLEMENTS (Oct. 1, 2015), http://www.bis.org/bcbs/history.htm [https://perma.cc/UM3E-7GV5]. Pillar 2 of Basel II required regulators to monitor risk-management models used by banks to ensure their adequacy. *See* BANK FOR INT'L SETTLEMENTS, BASEL COMM. ON BANKING SUPERVISION, PART 3: THE SECOND PILLAR–SUPERVISORY REVIEW PROCESS 6–9 (2006), http://www.bis.org/publ/bcbs128c.pdf [https://perma.cc/SS9L-3WLS] (outlining the "Supervisory Review" process).

95. Stress testing is applied by bank regulators to determine whether an institution could withstand adverse conditions resulting from economic changes. *See, e.g.*, Pavel Kapinos, Christopher Martin & Oscar Mitnik, *Stress Testing Banks: Whence and Whither?*, J. FIN. PERSP. (forthcoming 2016) https://www.fdic.gov/bank/analytical/CFR/2015/WP_2015/WP2015_07.pdf [https://perma.cc/RJ9X-3GDL] (reviewing how stress testing was developed, how it is implemented, and how it is likely to further develop).

96. Peter Conti-Brown, *Stress Tests and the End of Bank Supervision*, REGBLOG (Apr. 21, 2016), http://www.regblog.org/2016/04/21/stress-tests-and-the-end-of-bank-supervision/ [https://perma.cc/E5YU-8QMG].

97. The prudential banking regulators are not as resource constrained as their market-conduct counterparts; they fund their operations from fees charged to the banks, whereas the primary market-conduct regulators are obliged to seek funding from congressional appropriations in the current antiregulation environment. This small degree of independence, however, is not enough to make up for the kinds of resources a command-and-control form of regulation would require. Not only are there limits to the kinds of fees regulators can get away with when charging the industry itself, but there are also limitations on how effective such regulation could be, even in a world of unlimited resources.

98. Cary Coglianese, *Robot Regulators Could Eliminate Human Error*, REGBLOG (May 16, 2016), http://www.regblog.org/2016/05/16/coglianese-robot-regulators-eliminate-error [https://perma.cc/PEP2-XVC2].

C. RegTech

RegTech, the application of technology to regulatory activities,[99] is where thinking about regulation has to change. Although discretionary regulatory judgments are as important as ever, if not more important, they have to rest on a much more complex base of data, data tracking, and inferences, themselves a reflection of the enormous complexity of modern finance. Much of this analysis requires the aid of automation, so that regulators are able to apply their expert knowledge to what really matters from a regulatory perspective.

Just as finance is rapidly becoming automated, so too must regulation. Billions of dollars are being poured into the deployment of technology in finance, and this has led to a whole new "FinTech" industry that might, for the first time ever, be reforming the entire framework of financial services, from high-frequency trading to fraud prevention to personal wealth management.[100] Mobile phones, for example, are revolutionizing how consumers expect their financial services to be provided. And these developments are combining at stunning rates of change.[101] FinTech is the new buzzword for the legions of companies and banks that are now developing high-speed, automated products and services, using novel techniques including

99. For an explanation of RegTech, see generally INST. OF INT'L FIN., REGTECH IN FINANCIAL SERVICES: TECHNOLOGY SOLUTIONS FOR COMPLIANCE AND REPORTING, https://wwwiif.com/file/14970/download?token=vx29uy05 [https://perma.cc/VKM6-HP8L]; Douglas W. Arner, János Nathan Barberis & Ross P. Buckley, *FinTech, RegTech and the Reconceptualization of Financial Regulation*, NW. J. INT'L L. & BUS. (forthcoming 2016) [hereinafter Arner, Barberis & Buckley, *FinTech, RegTech and the Reconceptualization of Financial Regulation*], https://ssrn.com/abstract=2847806 [https://perma.cc/7JXB-VM53]; Douglas W. Arner, János Nathan Barberis & Ross P. Buckley, *The Evolution of Fintech: A New Post-Crisis Paradigm?* (Univ. of H.K., Faculty of Law Research Paper No. 2015/047, 2015), https://ssrn.com/abstract=2676553 [https://perma.cc/L84G-F6QA] (summarizing developments in RegTech).

100. *See* Arner, Barberis & Buckley, *FinTech, RegTech and the Reconceptualization of Financial Regulation*, *supra* note 99 (manuscript at 23).

101. The literature on one major example in the financial markets, namely high-frequency or "algo" trading, is exploding, as are the regulatory concerns. The leading thinkers on this issue are Erik Brynjolfsson and Andrew McAfee. *See generally* ERIK BRYNJOLFSSON & ANDREW MCAFEE, RACE AGAINST THE MACHINE: HOW THE DIGITAL REVOLUTION IS ACCELERATING INNOVATION, DRIVING PRODUCTIVITY, AND IRREVERSIBLY TRANSFORMING EMPLOYMENT AND THE ECONOMY (2011); ERIK BRYNJOLFSSON & ANDREW MCAFEE, THE SECOND MACHINE AGE: WORK, PROGRESS AND PROSPERITY IN A TIME OF BRILLIANT TECHNOLOGIES (2014). *See also* KLAUS SCHWAB, THE FOURTH INDUSTRIAL REVOLUTION (2016) (summarizing algo trading dynamics succinctly).

blockchain (distributed ledgers),[102] cloud computing, big data, component architectures, predictive coding, pattern analysis, and many other technology-enabled platforms, processors, and delivery systems.[103]

It is not unrealistic to expect that the regulation of these activities might also develop in the same direction. Regulators have hundreds of examiners at each of the big banks, but it seems unlikely that adding more and more individuals to their teams will help them to meet the challenge of big bank supervision. Notwithstanding possible cultural resistance by regulators themselves, the development of automated compliance, reporting, and monitoring is perhaps inevitable because it is hard to see how they will otherwise meet the demands of regulating extreme financial complexity. Large amounts of automation might be our only hope for cabining the gigantic and dynamic financial industry within the limits of safety and fair conduct.

There have been precursors to this development. Currency transaction reporting, involving millions of daily transactions, is monitored by the Treasury Department on an automated basis.[104] Both market-conduct and prudential regulators monitor high-frequency trading using automation techniques.[105] Perhaps the clearest example of major collaboration of algorithmic industry and regulation is the implementation of the regulatory-supervision components of Pillar 2

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102. One example of this is the proof of concept performed by R3. *See* R3, http://r3cev.com [https://perma.cc/Z8UQ-NGAQ]; Kim S. Nash, *Key Blockchain Vendors, Cloud Providers Square off in Major Test*, WALL STREET J.: CIO J. (Mar. 2, 2016), http://blogs.wsj.com/cio/2016/03/02/key-blockchain-vendors-cloud-providers-square-off-in-major-test/ [https://perma.cc/89Z5-SS95].

103. *See* U.K. GOV'T OFFICE FOR SCI., FINTECH FUTURES: THE UK AS A WORLD LEADER IN FINANCIAL TECHNOLOGIES (2015) (presenting a survey focused on London, a leader in the field of financial technologies).

104. Regulations promulgated under The Bank Secrecy Act require banks to file electronically a Currency Transaction Report for every transaction of more than $10,000. 31 C.F.R. § 1010.311; *see Currency Transaction Reporting—Overview*, FED. FIN. INST. EXAMINATION COUNCIL, https://www.ffiec.gov/bsa_aml_infobase/pages_manual/OLM_017.htm [https://perma.cc/LC93-4CER].

105. For example, the SEC has implemented a system (called "MIDAS") that combines advanced market-activity monitoring with empirical data to provide a better picture of what is taking place in the market. According to the SEC, MIDAS collects about one billion records from the proprietary feeds from each of the thirteen national equity exchanges. *See MIDAS Market Information Data Analytics System*, SEC. & EXCH. COMM'N, https://www.sec.gov/marketstructure/midas.html#.WAD1mzsyDFl [https://perma.cc/CX7V-SJ5Q]. Apparently the system will only be fully operational in three years. *See* Francine McKenna, *Critics Say SEC's Audit Trail Plan Falls Short*, MARKETWATCH (Apr. 27, 2016, 12:51 PM), http://www.marketwatch.com/story/critics-say-secs-audit-trail-plan-falls-short-2016-04-27 [https://perma.cc/Y6QC-VFT2].

of the Basel II and III frameworks of risk management.[106] From a command-and-control perspective, regulators' reliance on the automated risk-management systems adopted by big banks seems to be an abdication of regulatory responsibility: regulators are expected to do such monitoring themselves and not rely on the systems installed by the banks. Yet from the premises adopted in this Article, which emphasize the constant fluidity and adaptive character of financial markets[107] and the resource constraints under which regulators have to operate,[108] it seems entirely unrealistic to assume that regulators could even remotely supply the personnel power to perform their own evaluations of the risks incurred by complex finance.

For this reason, this Article urges that we recognize the importance of a companion development to FinTech, namely RegTech,[109] which involves the development, testing, and deployment of automated systems of compliance, reporting, and surveillance by regulators. Initial work on such a project has begun in many areas. The Financial Conduct Authority in the United Kingdom has a "regulatory sandbox" in which innovative pilot models are being tested with the banks.[110] The United Kingdom,[111] Singapore, China, and Hong Kong

106. As risk management has become more automated and complex, regulators have had to increasingly rely on the bank's own risk-management models to discharge their regulatory responsibilities. The approach they adopt is effectively codified in national implementations of Basel II and, now, Basel III, which require them to evaluate and approve the bank risk-management models ("supervisory review"). *See supra* note 94. The bank models are highly automated and could not realistically be replicated by the regulators themselves. Highly complicated distinctions are drawn in the way in which various categories of banks are treated. *See* BANK FOR INT'L SETTLEMENTS, IMPLEMENTATION OF BASEL STANDARDS—REGULATORY CONSISTENCY ASSESSMENT PROGRAM (RCAP), http://www.bis.org/bcbs/implementation.htm?m=3%7C14%7C587 [https://perma.cc/68N3-8UGH] (surveying progress around the world in implementing the Basel framework); *see, e.g.*, FED. RESERVE SYS., BASEL REGULATORY FRAMEWORK, http://www.federalreserve.gov/bankinforeg/basel/USImplementation.htm [https://perma.cc/9SDN-MA47] (providing a digest of the rules promulgated by the Federal Reserve to implement the Basel framework in the United States).

107. *See supra* note 15 and accompanying text.

108. *See supra* note 55 and accompanying text.

109. *See* U.K. GOV'T OFFICE FOR SCI., *supra* note 103 (presenting a helpful and quite detailed outline of RegTech's potential in modern bank regulation); *see also* Arner, Barberis & Buckley, *FinTech, RegTech and the Reconceptualization of Financial Regulation*, *supra* note 99 (manuscript at 30–43).

110. *See generally* FIN. CONDUCT AUTH. (FCA), REGULATORY SANDBOX (2015), https://www.fca.org.uk/publication/research/regulatory-sandbox.pdf [https://perma.cc/KB62-4VYM] (providing an overview of the regulatory "sandbox" and its implementation).

111. *See, e.g.* FIN. CONDUCT AUTH., BUSINESS PLAN 2016/17, at 32–33 (2016), https://www.fca.org.uk/publication/corporate/business-plan-2016-17.pdf [https://perma.cc/234J-RJ3V]; FCA, *supra* note 110.

have provided some government sponsorship[112] for RegTech pilots, and the U.S. OCC might be receptive.[113] A recent report by the Institute of International Finance[114] outlines the many areas in which RegTech has begun to emerge in the United States. Tentative examples are to be found in the fields of shareholder disclosures,[115] trading-behavior analysis,[116] trading compliance,[117] organizational trust dynamics,[118] and even capital regulation[119] (particularly in stress testing and risk weighting). A major, and possibly even transformative, development has been IBM's acquisition of the leading regulatory-compliance consulting firm, Promontory Financial Group, for the express purpose of introducing the immense artificial-intelligence analytics of Watson to the tasks of regulatory compliance and monitoring.[120]

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112. *See, e.g.*, Arner, Barberis & Buckley, *The Evolution of Fintech: A New Post-Crisis Paradigm?*, *supra* note 99 (manuscript at 20–28) (discussing developments in Asia).

113. *See* OFFICE OF THE COMPTROLLER OF THE CURRENCY, SUPPORTING RESPONSIBLE INNOVATION IN THE FEDERAL BANKING SYSTEM: AN OCC PERSPECTIVE 2 (2016), https://www.occ.treas.gov/publications/publications-by-type/other-publications-reports/pub-responsible-innovative-banking-system-occ-perspective.pdf [https://perma.cc/N2MJ-79QD].

114. INST. OF INT'L FIN., *supra* note 99, at 3–4. *See generally* Arner, Barberis & Buckley, *FinTech, RegTech and the Reconceptualization of Financial Regulation*, *supra* note 99; DELOITTE, REGTECH IS THE NEW FINTECH: HOW AGILE REGULATORY TECHNOLOGY IS HELPING FIRMS BETTER UNDERSTAND AND MANAGE THEIR RISKS (2015), https://www2.deloitte.com/content/dam/Deloitte/lu/Documents/financial-services/performancemagazine/articles/lu-how-agile-regulatory-technology-is-helping-firms-better-understand-and-manage-their-risks-24052016.pdf [https://perma.cc/R5YG-RK5N]; Lucy McNulty, *Regtech: Meet the New Faces of Compliance*, FIN. NEWS (Jan. 29, 2016), http://thetally.efinancialnews.com/2016/01/meet-new-faces-compliance/?mod=fintech-tally [https://perma.cc/T2EG-WLZJ] (listing new RegTech companies). The *Financial Times* has a special section on FinTech that also focuses on RegTech. FIN. TIMES, THE FUTURE OF FINTECH, https://www.ft.com/reports/future-of-fintech [https://perma.cc/4T63-V69F].

115. *E.g.*, FUNDAPPS, https://www.fundapps.co [https://perma.cc/MM48-NAGR] (organizing regulatory information and offering a cloud-based system for shareholder-disclosure filings across global jurisdictions).

116. *E.g.*, SYBENETIX, http://www.sybenetix.com/solutions/compass [https://perma.cc/X7XW-KZDQ] (providing systems to monitor market activity and detect unusual trading patterns).

117. *E.g.*, OPENGAMMA, http://www.opengamma.com [https://perma.cc/E8EF-NVN6] (offering margin-calculation solutions for clients).

118. *E.g.*, STARLING, http://starlingtrust.com [https://perma.cc/37HT-MJSJ] (stating a mission "to uncover the world's trust networks").

119. *E.g.*, SUADE, http://suade.org [https://perma.cc/RC4H-95UY] (providing a regulation-as-a-service platform in collaboration with regulators and regulatory models).

120. The acquisition was announced in September 2016 and has been greeted by the financial industry as introducing a whole new order of computing power to the field of financial regulation. *See* Penny Crosman, *IBM Buying Promontory Clinches It: RegTech Is Real*, AM. BANKER (Sept. 29, 2016), http://www.americanbanker.com/news/bank-technology/ibm-buying-promontory-clinches-it-regtech-is-real-1091692-1.html [https://perma.cc/7E7E-L3DR]; John Mannes, *Watson*

The potential of these new possibilities remains barely discernible, but it does seem that automation will produce an ever-expanding range of regulatory techniques. Among the most well-publicized examples of productivity-enhancing automation in the regulatory field is blockchain, the underlying technology of Bitcoin,[121] which holds out the promise of automated authentication and verification across a broad range of activities that regulators have traditionally had to monitor "by hand."[122] There is also automated trading compliance[123] and an emerging vista of collaborative monitoring between regulators and financial institutions themselves, such that the data that are produced by the systems of the institutions are themselves also coded to provide pertinent regulatory information automatically.[124]

Financial Services Is Born Out of IBM's Purchase of Promontory Financial Group, TECHCRUNCH (Sept. 29, 2016), https://techcrunch.com/2016/09/29/watson-financial-services-is-born-out-of-ibms-purchase-of-promontory-financial-group/ [https://perma.cc/E5GH-XMYG] (commentary and analysis); Press Release, IBM, IBM Announces Planned Acquisition of Promontory to Transform Regulatory Compliance with Watson (Sept. 29, 2016), http://www-03.ibm.com/press/us/en/pressrelease/50599.wss [https://perma.cc/K5M4-CNX4] (announcing acquisition to create "Watson Financial Services"). The IBM–Promontory deal has been compared with other recent alliances between financial organizations and advanced digital-computing companies, such as NASDAQ and Digital Reasoning, as well as Credit Suisse and Plantir. *See* Ben Dipietro, *The Morning Risk Report: IBM-Promontory Deal Marks Growth of AI-Driven Compliance*, WALL STREET J.: RISK & COMPLIANCE J. (Oct. 3, 2016, 7:11 AM), http://blogs.wsj.com/riskandcompliance/2016/10/03/the-morning-risk-report-ibm-promontory-deal-marks-growth-of-ai-driven-compliance/ [https://perma.cc/4PAY-J4BM].

121. *See, e.g.*, Pete Rizzo, *KPMG: Blockchain Could Be 'Antidote' to High Cost of Regulation*, COINDESK (Mar. 4, 2016), http://www.coindesk.com/kpmg-blockchain-antidote-regulatory-costs/ [https://perma.cc/RKZ8-5KW7] (summarizing responses by professional-service firms to the evolving blockchain-technology space). Blockchain is a data-transport system that permits the creation of decentralized ledgers, such that intermediaries can be bypassed altogether and smart algorithms can be introduced, for example, to remove previously human tasks involved in validating agreements to create self-executing "smart contracts." While Bitcoin, a crypto- or digital currency, is a better-known concept to the public, blockchain, the technology upon which Bitcoin depends, has a much broader range of potential applications. For a crisp description of blockchain, see, for example, Steven Norton, *CIO Explainer: What Is Blockchain?*, WALL STREET J. CIO J. (Feb. 2, 2016, 12:49 AM), http://blogs.wsj.com/cio/2016/02/02/cio-explainer-what-is-blockchain/ [https://perma.cc/CS9L-8Q5A].

122. For example, money could be "wired" directly from a payor to a payee without the need for the transfer to go through an intermediary such as SWIFT, and self-validating stock transactions could be made directly between buyer and seller without the need for a clearinghouse. *See* Norton, *supra* note 121.

123. *See supra* note 117 and accompanying text.

124. For a broadening range of possibilities, see, e.g., CREDIT SUISSE, BLOCKCHAIN—THE TRUST DISRUPTER (Aug. 3, 2016), http://www.the-blockchain.com/docs/Credit-Suisse-Blockchain-Trust-Disrupter.pdf [https://perma.cc/3PYK-RJ5X]; INST. INT'L FIN., REGTECH IN FINANCIAL SERVICES, *supra* note 99.

Of course, the new development, discipline, and promise of RegTech will not displace the need for constant adjustments to the models to keep pace with the changing marketplace. Nor would it eliminate a constant need to handle exceptions to automated notifications, fix bad algorithms, and so on. Regulatory judgment based on experience and changing overall circumstances will continue to have a central role to play, so high-quality regulators will continue to be indispensable. For example, data can produce signals of financial activity gone awry, but regulatory discretion is still needed to determine whether specific trends are sufficient cause for concern to warrant regulatory intervention. "Big picture" macroprudential issues and public-policy goals that transcend the immediate interests of specific institutions, all matters with which regulators are likely to be better acquainted than businesspeople focused on the immediate concerns of their businesses, have to be factored into decisions about whether regulatory action is becoming necessary. Regulators would need models and algorithms, but these would not simply be the same ones developed and used by the banks that they regulate, because regulatory supervision and operational risk management are separate activities serving distinct purposes. The former are designed to serve the public purpose, and the latter are designed to promote the profitability of the bank.

Finally, the regulator-set algorithmic rules would themselves embody as many policy choices and legal validity issues as the regulations governing the conduct or circumstances in question. Regulators would have to demonstrate that their systems are reliable and that whatever discretion is being exercised in establishing and maintaining such systems is within the scope of their legal authority. In short, regulators would continue to play critical roles; they would just rely much more on automation than is presently the case and is how we presently conceive the role of regulation.

CONCLUSION

Of course, none of these proposals would counter the arguments of those who believe regulation to be inherently suspect or regulatory discretion to be inherently untrustworthy.[125] Nor would they satisfy

125. Skepticism about the value of regulation and regulators has long been a feature of public choice theory. More recently, in the context of financial regulation, it is found in various formats. *See, e.g.*, ALLISON, *supra* note 42, at 5–6; Mark A. Calabria, Dir. Fin. Reg. Studs., Cato Inst., Remarks at the University of Minnesota School of Law: Financial Regulation: Market or

those with a punitive mindset. In addition, it would be naive to imagine that automated supervision would eliminate political controversy, since the bases for disagreeing on policy solutions rest on different views of economic behavior and regulatory effectiveness.

Nevertheless, although some wrongs can be righted by private-attorney-general suits, the central challenges of bank soundness and financial stability cannot really be addressed effectively through such mechanisms. For those of us who continue to believe that regulatory moderation of markets is essential, and believe in the merits of pursuing the goal of an ideal balance between market discipline and regulatory discipline, this Article suggests that we will attain more productive and effective results by seeking a modernization of regulation along similar lines to the modernization of our technology-driven finance and technology-oriented society itself.

If this view is correct, then automation not only presents unique new solutions but also great challenges for financial regulation. The successful development of financial RegTech will entail a complex blend, on the one hand, of accurate and well-articulated algorithms that can reduce to automation a large array of essentially mechanistic analyses and, on the other, of a series of flexible and skillfully identified public-policy judgments that will promote the values of stability, fairness, efficiency, transparency, and manageability all that partisans presumably hold as their ideal. This goal is a very tall order, but it will not be attained through ham-handed legislation, regulation, or blunt resistance. It will only be achieved over time, with the introduction of many new skill sets and a positive desire to create a financial system that is regulated reasonably and for the common weal.

Government (Feb. 13, 2013), http://www.cato.org/publications/speeches/financial-regulation-market-or-government [https://perma.cc/G4UP-FRYV] (stating that regulation generates moral hazard and that regulators have the wrong incentives to do the right thing). *See also supra* text accompanying note 53.