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Why Financial Regulation Keeps Falling Short

Law Working Paper N° 494/2020
February 2020

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Abstract

This article argues that there is a fundamental mismatch between the nature of finance and current approaches to financial regulation. Today's financial system is a dynamic and complex ecosystem. For these and other reasons, policy makers and market actors regularly have only a fraction of the information that may be pertinent to decisions they are making. The processes governing financial regulation, however, implicitly assume a high degree of knowability, stability, and predictability. Through two case studies and other examples, this article examines how this mismatch undermines financial stability and other policy aims. This examination further reveals that the procedural rules meant to promote accountability and legitimacy often fail to further either end. They result instead in excessive expenditures before new rules are adopted, counterproductive efforts to perfect ever more detailed rules, and too little re-evaluation of existing rules in light of new information or changed circumstances. The mismatch between the nature of finance and how finance is regulated helps to explain why financial regulation has failed in the past and why it will likely fail again. It also suggests the need for a new approach to financial regulation, one that acknowledges the limits of what can be known given the realities of today's complex and constantly evolving financial ecosystem.

Keywords: Financial regulation, financial stability, bank regulation, money market regulation, administrative law, experimentalism, dynamism, complexity

JEL Classifications: G2, K2

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Table of Contents

Introduction 3
I. The Nature of Modern Finance 7
a. Dynamism 7
i. The cyclical nature of finance 7
ii. Regulatory endogeneity 8
iii. Innovation 9
iv. Radical change 11
b. Complexity 12
c. Unknowns 13
II. How Finance is Regulated 15
a. International Financial Regulation 15
b. Statutes 16
c. Rulemaking 18
d. Supervision 20
e. Where does this leave us? 21
III. Financial Regulation in Practice 22
a. Money market mutual fund reform 22
b. The Basel capital and liquidity requirements 28
c. Broadening the lens 34
IV. Some Progress 36
a. Reforms Underway 37
i. Harnessing New Technology and Data Standardization 37
ii. Stress Testing 38
b. Proposals for Further Reform 40
i. Automatic Sunset Clauses 41
ii. Experimentalism and Experimentation 42
V. A More Holistic Approach to Financial Regulation 44
Conclusion 47

Electronic copy available at: https://ssrn.com/abstract=3530056

Introduction

The financial crisis of 2007–2009 and the devastation it wreaked on the United States and other economies triggered a global rulemaking frenzy. In the United Kingdom, the prudential rulebook for banks ballooned from roughly 400,000 words in 2007 to well over 720,000 in 2017.[1] That's the equivalent of almost 100 words of new rules per day, each and every day, for a decade. In the United States, the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010, similarly weighed in at a whopping 364,844 words (or nearly 850 pages).[2] The Dodd–Frank Act further required eleven different federal agencies—sometimes working alone, other times in conjunction with others—to undertake 243 separate rulemaking processes and conduct 67 studies.[3] Using techniques from software programming, Andrew Lo and his co-authors found that, while "the average law is not very complex," the Dodd–Frank Act most certainly is.[4] They further found that Title 12 of the U.S. Code, which governs banks and banking, is second only to the tax code in its complexity, and it is complex in ways that make failure likely, even before one moves from the code to the dense thicket of regulations implementing the statutory scheme.[5]

Given that almost a decade has passed since the Dodd–Frank Act and many other key post-crisis reforms were adopted, this is an opportune time to assess what we have learned about the processes governing how finance is regulated. One of the most striking features of the current landscape is just how much contestation remains. The core aim of all of this new rulemaking was to promote a more stable and resilient financial system. Yet it is far from clear whether the system is safer today than it was ten years ago. Global SRISK, a measure of systemic risk designed by Nobel Laureate Robert Engle and colleagues, is higher today than at any point in the last twenty years—including at the height of the financial crisis and the subsequent European sovereign debt crisis.[6] Natasha Sarin and Larry Summers have shown that an array of key metrics of bank riskiness, such as volatility and expected returns, have not gone down following the adoption of post-crisis reforms, and some are even higher today. As they explain, these metrics suggest the heighted capital requirements and other reforms have not reduced "the risk of insolvency for major banks … as much as is generally supposed."[7]

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[1] Zahid Amadxarif, James Brookes, Nicola Garbarino, Rajan Patel & Eryk Walczak, *The Language of Rules: Textual Complexity in Banking Reforms* 21–23 (Bank of Eng., Staff Working Paper No. 834, 2019).

[2] Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank), Pub. L. No. 111-203, 124 Stat. 1376 (2010); William Li, Pablo Azar, David Larochelle, Phil Hill & Ani Lo, *Law is Code: A Software Engineering Approach Analyzing the United States Code*, 10 J. BUS. & TECH. L. 297, 335 (2015) (ranking laws from the 111th Congress by length).

[3] DAVIS POLK, SUMMARY OF THE DODD-FRANK WALL STREET REFORM AND CONSUMER PROTECTION ACT, ENACTED INTO LAW ON JULY 21, 2010, at i (2010), https://www.davispolk.com/files/files/Publication/7084f9fe-6580-413b-b870-b7c025ed2ecf/Preview/PublicationAttachment/1d4495c7-0be0-4e9a-ba77-f786fb90464a/070910_Financial_Reform_Summary.pdf.

[4] Li et al., *supra* note [2], 334.

[5] Dodd–Frank is not alone in earning this dubious distinction. Others in this domain include the Patient Protection and Affordable Care Act and a number of omnibus bills. Id.

[6] *Systemic Risk Analysis*, V-LAB, https://vlab.stern.nyu.edu/welcome/srisk (last visited Nov. 16, 2019).

[7] Natasha Sarin & Lawrence Summers, *Understanding Bank Risk Through Market Measures*, BROOKINGS PAPERS ON ECON. ACTIVITY, Fall 2016, 57, 60.

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More qualitative assessments of the aggregate impact of this massive reform project are similarly mixed.[8] In a review of the aggregate effects of the reforms, the Bipartisan Policy Center concluded that the financial system is likely safer today than it was before the crisis, but there are a number of "less-than-optimal outcomes and unintended consequences of [the] post-crisis reform[s]."[9] Echoing a similar sentiment Mark Zandi, chief economist at Moody's Analytics, believes that the reforms have been helpful on a number of fronts, but in requiring "banks to hold more capital and be more liquid, risk-taking is shifting to the less regulated and more opaque part of the financial system known as the 'shadow system.' The next financial event or crisis will likely emanate from here."[10] Richard Sylla, financial historian at New York University's Stern School of Business, put it most bluntly. When asked whether the post-crisis reforms have erected the guardrails needed to protect against another crisis, he responded: "In a word, no."[11]

Shifting from aggregate assessments to the impact of specific reforms doesn't resolve this contestation. A recent report from the Congressional Research Service acknowledges that even though numerous provisions in the Dodd–Frank Act were designed to ensure that large financial institutions could be wound down without threatening the health of the broader financial system, ten years and a great deal of rulemaking later, "commentators continue to debate whether these provisions have improved the resiliency of the financial system."[12] The impact of a new, post-crisis requirement that all standardized derivatives be centrally cleared has been similarly mixed. The good news is that the reform seems to have had the intended, beneficial effect of improving transparency in derivatives markets and facilitating multilateral netting in ways that might reduce contagion and uncertainty in the event that a major financial institution fails. The bad news is that the resulting concentration of market activity has had the unintended and quite serious consequences of creating new sources of systemic risk and reducing interbank monitoring.[13] Other examples abound.[14]

Our aim here is not to defend or condemn any of the specific reforms put in place in the aftermath of the crisis. We believe that many have improved the resilience of the financial system, and we are skeptical of the recent efforts to roll back the progress that has been made. That said, we see the degree of ongoing contestation about what is working, what is not, and why, as itself important. The devastation the financial crisis wreaked on the

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[8] Emily Stewart, *How Close Are We to Another Financial Crisis? 8 Experts Weigh in*, VOX (Sept. 18, 2018), https://www.vox.com/2018/9/18/17868074/financial-crisis-dodd-frank-lehman-brothers-recession (collecting the views of experts on the likelihood of another financial crisis a decade following the collapse of Lehman Brothers).

[9] MARTIN N. BAILY, JUSTIN SCHARDIN & PHILLIP L. SWAGEL, BIPARTISAN POLICY CTR., DID POLICYMAKERS GET POST-CRISIS FINANCIAL REGULATION RIGHT? 3 (2016), https://bipartisanpolicy.org/wp-content/uploads/2019/03/BPC-FRRI-Post-Crisis-Financial-Regulation.pdf

[10] *Id.*

[11] *Id.*

[12] Jay Sykes, CONG. RESEARCH SER., R45162, REGULATORY REFORM 10 YEARS AFTER THE FINANCIAL CRISIS: SYSTEMIC RISK REGULATION OF NON-BANK FINANCIAL INSTITUTIONS 1 (2018).

[13] *See* Ivana Ruffini, *Central Clearing: Risks and Customer Protections*, FED. RES. BANK OF CHI.: ECON. PERSPECTIVES, 4Q/2015, at 90 (describing how changes to regulation of counterparties following the financial crisis gave rise to new sources of risk); Press Release, Goldman Sachs, A Path Forward for CCP Resilience, Recovery, and Resolution (Oct. 24, 2019), https://www.goldmansachs.com/media-relations/press-releases/current/multimedia/ccp-paper.pdf.

[14] *See infra* Part III.

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real economy was unequivocal. In the United States alone, unemployment jumped to ten percent, major stock indices fell by half, and nearly nine million families lost their homes through foreclosure or related processes.[15] The need for massive reform was uncontested, even if many of the specific reform efforts were. Given the immensity of the public and private resources that have been brought to bear on the problem of financial fragility, that so many questions linger about the impact of the reforms and the health of the financial system is itself troubling. Our aim with this paper is to explore how this is possible. Why hasn't this immense reform effort produced a demonstrably more stable financial system? Answering this question not only helps to explain where we are now, but also why financial regulation has so often failed in the past.

The literature already offers a number of potential explanations for why financial regulation so often falls short. One explanation, advanced by Roberta Romano, is that regulation is too often the byproduct of an impulsive legislative response to a specific scandal or crisis.[16] The net effect, in Romano's view, is ill-conceived regulation designed more to quell public outrage than to address underlying problems. A second explanation, rooted in public choice theory, posits that banks and other regulated actors exert too much influence over the lawmaking process, resulting in rules that protect their narrow interests at the expense of the wider public.[17] A third, related explanation stems from the observation that public pressure to respond to financial crises is often fleeting—with the result that financial regulation tends to weaken, in substance or effect, as the memory of a crisis fades over time.[18]

Each of these accounts helps to explain why financial crises recur so often and in such familiar ways. Each also sheds some light on why the current reform project has not been more successful. Yet, even collectively, the existing accounts fail to provide a complete explanation for the disconcerting state of affairs we now face. Romano's account is incomplete insofar as many of the most contentious post-crisis reforms were developed and

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[15] *See* U.S. GOV'T ACCOUNTABILITY OFF., GAO-13-180, FINANCIAL REGULATORY REFORM: FINANCIAL CRISIS LOSSES AND POTENTIAL IMPACTS OF THE DODD–FRANK ACT 17–18 (2013) ("The monthly unemployment rate peaked at around 10 percent in October 2009 and remained above 8 percent for over 3 years making this the longest stretch of unemployment above 8 percent in the United States since the Great Depression."); Laura Kusisto, *Many Who Lost Homes to Foreclosure in Last Decade Won't Return—NAR*, WALL ST. J. (April 20, 2015) ("More than 9.3 million homeowners went through a foreclosure, surrendered their home to a lender or sold their home via a distress sale between 2006 and 2014."); Alexandra Twin, *Dow Fights Back*, CNNMONEY (Mar. 6, 2009), https://money.cnn.com/2009/03/06/markets/markets_newyork/index.htm ("Since closing at all-time highs on Oct. 9, 2007, the Dow has lost nearly 53% and the S&P 500 has lost 56%.").

[16] *See generally* Roberta Romano, *The Sarbanes-Oxley Act and the Making of Quack Corporate Governance*, 114 YALE L.J.,1521 (2005) [hereinafter Romano, *Sarbanees-Oxley*] (attributing the shortfalls in the corporate governance reforms contained in the Sarbanes-Oxley Act, in part, to the frantic political environment that followed in the wake of the Enron and Worldcom scandals).

[17] Gordon Tullock, *Public Choice in* THE NEW PALGRAVE DICTIONARY OF ECONOMICS (Palgrave Macmillan ed., 2019).

[18] *See* John Coffee, Jr., *The Political Economy of Dodd–Frank: Why Financial Reform Tends to be Frustrated and Systemic Risk Perpetuated*, 97 CORNELL L. REV. 1020, 1020–37 (2012) (establishing the idea of a "Regulatory Sine Curve," from which it follows that the appetite for financial regulatory reform fluctuates based on temporal proximity to market crashes); *see also* Art Wilmarth, *The Road to Repeal of the Glass-Steagall Act*, 17 WAKE FOREST J. BUS. & INTELL. PROP. L. 441 (2017) (describing a renewed interest in the aftermath of the financial crisis in reconstructing the structural barriers between commercial banks and capital markets erected by the Glass-Steagall Banking Act of 1933).

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proposed not by Congress, but by far less political, more technocratic and more deliberative organizations. That many of the unintended consequences of the reforms pose greater threats to banks than to the public is at odds with a simple public-choice account of why the post-crisis rules may not be optimal. And the tendency for regulations to weaken in substance and effect over time does not explain the many questions being asked about the efficacy of the reforms themselves.

This article expands this list of explanations to include the nature of modern finance. It shows that another reason financial regulation keeps falling short—and will again unless revamped—is that the processes through which finance is regulated are poorly suited to the realities of modern finance. Modern finance is dynamic and complex. In this environment, policymakers inevitably operate with an incomplete understanding of how the financial system works and how it will respond to regulatory intervention. Exacerbating this challenge is the tendency for the financial system to evolve in ways that minimize the cost of complying with the existing regime, and hence in ways that tend to involve the movement of activity outside of regulated domains. Tomorrow's financial system will not look like today's, and efforts to improve the stability and functioning of today's system will be among the factors driving that change.

Despite the complex and dynamic nature of modern finance, the processes governing how finance is regulated are often rooted in trans-substantive frameworks designed to accommodate domains that operate quite differently, or that reflect the static financial systems of a bygone era. The result is processes that implicitly assume that policymakers and other stakeholders understand the system they are regulating and how that system will respond to a given intervention. The results of this mismatch are myriad. In addition to resulting in regulations that fail to achieve desired aims, they include excessive expenditure of public and private resources before new rules are adopted, counterproductive efforts to perfect rules, and too little meaningful accountability. We argue that this mismatch helps to explain the ongoing contestation surrounding the impact of post-crisis regulatory reforms.

In offering a different explanation of the problem, we also advance a different approach for how to fix it. The good news—if it can be called that—is that finance is far from the only dynamic, complex and incompletely understood ecosystem in which we are nevertheless compelled to intervene. The human body is another. Just as morbidity and mortality have declined as doctors have gone from simply treating disease to thinking more broadly about how to promote health, we suggest that the efficacy and resilience of the financial system could be enhanced by moving past efforts to narrowly address specific market failures and toward a more holistic and health-oriented approach to finance. We thus conclude by considering in broad terms what a more holistic approach to financial regulation might entail and how it could help mitigate the mismatch that we identify as a core challenge for financial regulation today.

This article proceeds in five parts. Part I examines the interrelated phenomena of dynamism, complexity, and unknowns, and identifies each as core features of financial markets and institutions today. Part II provides a stylized account of how finance is regulated, looking specifically at the core legal processes governing how financial regulation is made. Part III examines this mismatch in action: using two case studies—post-crisis money market mutual fund reform and the evolution of bank capital requirements—to demonstrate what actually happens when legal processes try to keep pace with the speed,

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complexity, and opacity of modern finance. Part IV examines some of the recent regulatory reforms, along with proposals for further reform, that can be viewed as attempting to respond to elements of this mismatch. This analysis suggests that while modest progress has been made, there are inherent limits in trying to use the existing regulatory framework to bridge the growing gap between finance and financial regulation. In Part V, we present our blueprint for how to start to build a more holistic approach to financial regulation. By recognizing the constitutive role of law in finance and embracing a more holistic mindset, we can devise new ways of analyzing how best the law can promote resilience and other aims.

I. The Nature of Modern Finance

Crafting effective financial regulation demands that policymakers start with an accurate understanding of the nature of the financial system and how it responds to regulation. This Part lays that foundation. It demonstrates how dynamism, complexity, and unknowns are both core features of finance and core challenges for financial regulation. To many, this might seem like a relatively uncontroversial observation. Unfortunately, the current state of financial regulation suggests that this observation has not been taken to heart. Indeed, while academics, policymakers, and others often pay lip service to the idea that the financial system is characterized by complexity, dynamism, and pervasive unknowns, most still cling to regulatory frameworks and processes[19] that look increasingly antiquated once we move these features to the center—rather than just the periphery—of finance. Given that these features, collectively, continue to receive short shrift in academic and policy discussions in ways that we see as detrimental to both the quality and legitimacy of financial regulation, our aim here is not only to gesture at them, but to explain why they ought to be placed center stage in any discussion about how finance is regulated.

a. Dynamism

Paul Volcker, former Chairman of the Federal Reserve Board of Governors, recently observed: "What almost overwhelms me in looking at the world of finance — banking and beyond banking — is how different it is from when I was most active."[20] This subpart explains why that is, why the financial system is continuing to evolve, and why dynamism is endemic to finance.

i. The cyclical nature of finance

One source of constant dynamism is the cyclicality that is built into finance. Stability in finance is not a sign that things are static, but rather an important driver of structural change. As Hyman Minsky argued nearly fifty years ago: "sustained economic growth, business cycle booms, and the accompanying financial developments … generate conditions conducive to disaster for the entire economic system."[21] This occurs because "the structural

[19] For a description of such views, *see infra* Part II.

[20] Mike Mayo, *Paul Volcker on Conflicts, Ethics, and the US Banking Industry*, CFA INST. (Feb. 25, 2019), https://blogs.cfainstitute.org/investor/2019/02/25/paul-volcker-on-conflicts-ethics-and-the-us-banking-industry/.

[21] Hyman Minsky, *Financial Instability Revisited: The Economics of Disaster*, Steering Comm. for the Fundamental Reappraisal of the Disc. Mechanism appointed by the Bd. of Governors of the Fed. Reserve Sys.,

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characteristics of the financial system change during periods of prolonged economic expansion."[22] Stability breeds inflated expectations that this stability will continue, which drives the very risk-taking that in time will bring it to an end.[23]

Economists since Minsky have formalized some of the ways that periods of stability spur changes in behavior and pricing that contribute to the structural dynamics that he viewed as core. Work on the credit cycle, for example, shows how changes in the price of assets used as factors of production and as collateral for loans can accelerate boom and bust cycles.[24] John Geanakoplos has shown that periods of growth lead to higher leverage, which translates into higher asset prices, providing a distinct mechanism for built-in cyclicality.[25] Economists have also started offering more institutionally nuanced accounts of the ways that stability can breed risk-taking. Markus Brunnermeier and Lasse Pedersen, for example, have shown how interactions between the two sides of dealer balance sheets can exacerbate cyclicality.[26] The mechanisms formalized in these accounts vary, but each shows that the behavior of market participants and the structures they build are constantly changing, and changing in ways that may exacerbate fragility.

ii. Regulatory endogeneity

Regulation further contributes to the dynamism and cyclicality of finance. Most importantly, regulation spurs regulatory arbitrage. As Robin Greenwood and co-authors explain: "There is no set of ex ante rules, no matter how granular or how sophisticated, that can satisfactorily tackle the problem of regulatory arbitrage."[27] When new regulations are introduced, the structure of the financial system will inevitably evolve to reduce the costs of compliance. This dynamic can be observed in the repeated growth of various forms of "shadow banking." This term grew to prominence following the crisis, as it became apparent that many of the early cracks had emanated from a network of interconnected institutions that collectively engaged in the same type of credit, maturity, and liquidity transformation as conventional banks. Like banks, this network funded mortgages and other long-term loans using short-term debt, with commercial paper, repurchase (or "repo") agreements, and money market funds serving as substitutes for deposits.[28] In between these two ends laid an array of institutions and relationships that functioned largely outside the

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at 1 (1970), https://fraser.stlouisfed.org/files/docs/historical/federal%20reserve%20history/discountmech/fininst_minsky.pdf.

[22] *Id.*, 1–2.

[23] *Id.*

[24] Nobuhiro Kiyotaki & John Moore, *Credit Cycles*, 105 J. POL. ECON. 211 (1997); *see also* Ben Bernanke, Mark Gertler & Simon Gilchrist, *The Financial Accelerator and the Flight to Quality*, 78 REV. ECON. & STAT. 1 (1996); Arvind Krishnamurthy & Tyler Muir, *How Credit Cycles Across a Financial Crisis* 1–6 (Nat'l Bureau of Econ. Research, Working Paper No. 23850, 2017).

[25] John Geanakoplos, *The Leverage Cycle* 1–5 (Cowles Found. Discussion Paper No. 1715, 2009).

[26] Markus Brunnermeier & Lasse Pedersen, *Market Liquidity and Funding Liquidity*, 22 REV. FIN. STUD. 2201 (2008), https://academic.oup.com/rfs/article-abstract/22/6/2201/1592184.

[27] Robin Greenwood et al., *Strengthening and Streamlining Bank Capital Regulation*, BROOKINGS PAPERS ON ECON. ACTIVITY (Aug. 2017), https://www.brookings.edu/wp-content/uploads/2017/09/6_greenwoodetal.pdf; *see also* Charles Calomiris, *Financial Innovation, Regulation, and Reform*, 29 CATO J. 65, 65 (2009) ("Financial innovations often respond to regulation by sidestepping regulatory restrictions that would otherwise limit activities in which people wish to engage.").

[28] For a description, *see* Zoltan Poszar et al., *Shadow Banking* (Fed. Reserve Bank of N.Y. Staff Report No. 458, 2010), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr458.pdf.

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perimeter of banking regulation. Given the myriad costs associated with operating a bank, from complying with activity restrictions to ongoing supervisory oversight and deposit insurance premiums, regulatory arbitrage was likely among the forces driving the rapid growth of this shadow banking system in the years leading up to the crisis.

Yet this was not the first or only shadow banking system. Economic historian Hugh Rockoff has shown that eleven of the twelve financial panics in the United States between 1819 and 2008 emanated from that day's version of the shadow banking system. The Panic of 1907, for example, which led to the creation of the Federal Reserve, erupted in trust companies: institutions that had provided bank-like services but had grown just outside a private clearinghouse regime that helped protect banks from destabilizing runs.[29] Like any regime—public or private—that promotes the safety and soundness of financial institutions, this clearinghouse regime entailed significant costs. Those costs created opportunities for market participants who could find ways to provide bank-like services without assuming the corresponding burdens.

At least in the United States, there does not seem to be any way to escape this pattern. The regulatory burdens imposed following the crisis—no matter how justifiable—will invite yet further evolution and the migration of activity to less regulated spaces. These developments are already underway. For example, a recent report by the Housing Finance Policy Center shows that most home loans are now securitized by government-affiliated entities.[30] And as of June 2018, nonbanks originated 64% of those mortgages—a dramatic increase from the pre-crisis era.[31] Nonbanks also provide disproportionately more credit to borrowers with lower credit scores.[32] Other recent reports show that the same thing is happening beyond housing, and beyond the United States.[33] The significant new regulatory burdens imposed on banks are not stopping the flow of credit; instead, the system is evolving to provide that credit outside the regulated banking sector.

iii. Innovation

Another important driver of the dynamism of modern finance is innovation. These innovations include theoretical insights (like the Black-Scholes option pricing model), technological innovations (like massive increases in computing power), and the emergence of new financial markets, institutions, and instruments (like derivatives and structured finance). Indeed, dramatic change in finance very often entails the combination of all three types of innovation. The almost daily pronouncements about how big data and artificial intelligence

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[29] COPING WITH FINANCIAL CRISES: SOME LESSONS FROM ECONOMIC HISTORY __ (Hugh Rockoff & Isao Suto eds., Springer 2018); *see also* ROBERT BRUNER & SEAN CARR, THE PANIC OF 1907: LESSONS LEARNED FROM THE MARKET'S PERFECT STORM (2007).

[30] Laurie Goodman et al., *Housing Finance at a Glance: A Monthly Chartbook*, HOUSING FIN. POL'Y CENTER (July 2018), https://www.urban.org/sites/default/files/publication/98817/july_2018_chartbook_0.pdf.

[31] *Id.*, 12.

[32] *Id.*, 13.

[33] For an overview of recent trends, *see* Paul Davies, *Banks and Private Markets: Marking Fresh Connections*, WALL STREET J. (Aug. 8, 2018), https://www.wsj.com/articles/banks-and-private-markets-making-fresh-connections-1533722346.

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are going to "disrupt" finance are merely the most recent manifestations of a continual process of innovation that has been underway for decades, if not centuries.[34]

Consider again the rise of the particular form of shadow banking that emerged prior to the last crisis. Depending on how one measures it, this system remains as large as the regulated banking sector.[35] Even if its growth was propelled in part by regulatory cost savings, the capacity to disperse risks once concentrated in banks across the financial system may also have had real efficiency gains, enabling homeowners and others to access more affordable credit.[36] Neither the regulatory cost savings nor those efficiency gains, however, would have been possible without the myriad of technologies enabling securitization, money market funds, and other key features of this system. These innovations included creative new uses of legal structures, new modeling techniques, and massive increases in computing power that allowed the collection and analysis of vast amounts of data about creditor and asset quality.

In the decade since the crisis, innovation has continued apace. In the past three years alone, more than $120 billion in new capital has been invested globally in fintech firms.[37] Established banks too are investing in innovation. A recent Citibank report shows that banks spend 15–25% of their annual budgets on improvements in technology.[38] To put that in perspective, this means the median spending on technology is *higher* in the banking sector than in any other single sector—including "high tech" firms.[39] Even a brief look at the technologies currently changing finance—from the use of big data and artificial intelligence in assessing creditworthiness[40] to the ongoing experimentation with blockchain as a means of transforming how assets are held and transferred—suggests significant changes lie ahead.[41]

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[34] *See* Citi GPS: Global Perspectives & Solutions, *Bank of the Future: The ABCs of Digital Disruption in Finance* (March 2018), https://www.codex.com/wp-content/uploads/2018/04/Bank_of_the_future.pdf.

[35] Kathryn Judge, *Information Gaps and Shadow Banking*, 103 VA. L. REV. 411, 415 (2017) [hereinafter Judge, *Information Gaps*] ("Recent estimates suggest that the shadow banking system in the United States is larger than the banking system and poised for further growth").

[36] Kathryn Judge, *Investor-Driven Innovation*, 8 HARV. BUS. L. REV. 291, 329 (2018) [hereinafter Judge, *Investor-Driven Innovation*] ("One of the most important benefits of investor-driven innovation is its potential to improve price efficiency and reduce the cost of capital for borrowers. For example, by expanding the types of investors who could provide capital to home loans, the innovations just described should have, and seemingly did, reduce the cost of getting a home loan.").

[37] Lauren Mostowyk, *Global Fintech Funding Tops US$31B for 2017 – Fueled by US$8.7B in Q4: KPMG's Pulse of Fintech Report*, KPMG (Feb. 13, 2018), https://home.kpmg.com/xx/en/home/media/press-releases/2018/02/global-fintech-funding-tops-us-31b-for-2017-fueled-by-us-in-q4-kpmg-pulse-of-fintech-report.html.

[38] Citi GPS: Global Perspectives & Solutions, *supra* note 34, 59 ("IT expenses as a percentage of revenues are notably higher in the Banking industry than any other (~9%) and almost 2-3x those of other major industries. [Citi's] bottom-up analysis indicates that approximately [] 15-25% of banks' annual costs are allocated to IT.").

[39] *Id.*

[40] See Aaron Klein, *Brookings Report: Credit denial in the age of AI*, BROOKINGS INST. (Apr. 11, 2019), https://www.brookings.edu/research/credit-denial-in-the-age-of-ai/ (explaining that in ways both good and bad, "AI has the power to transform consumer lending").

[41] Marco Iansiti & Karim Lakhani, *The Truth About Blockchain*, HARV. BUS. REV., Jan.–Feb. 2017 at 118, 119–20, https://hbr.org/2017/01/the-truth-about-blockchain ("Blockchain is a *foundational* technology: It has the potential to create new foundations for our economic and social systems.").

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New technologies are already disrupting established institutions in many emerging markets. The rise of the so-called "shadow payment system"[42]—institutions that perform core payment functions outside the regulated banking system—in Asia, Africa, and South America is just one example of how new technology is changing the face of finance. In China, for example, platforms such as Alipay and WeChat Pay have each attracted almost one billion users. In Sub-Saharan Africa, meanwhile, over 130 mobile money platforms have been launched in the decade since the first platform, M-Pesa, was established in Kenya. Only a few short years ago, technological limitations would have made these developments almost unthinkable.

iv. Radical change

Dynamism is sometimes incremental and predictable. But sometimes it is not. The relentless dynamism of the financial system may well result in changes that are hard to even imagine today. Such claims are not just the domain of technologists. In 2006, it would have likely seemed unthinkable that in a few short years, of the five leading investment banks—Goldman Sachs, Merrill Lynch, Bear Stearns, Lehman Brothers, and Morgan Stanley—one would file for bankruptcy, another would be acquired to avert bankruptcy, a third would need to be acquired to ensure its survival, and the remaining two would both choose to become far more heavily regulated bank holding companies. Yet that is precisely what happened.

Mervyn King, former head of the Bank of England, puts the situation thusly:

> The essential challenge facing everyone living in a capitalist economy is the inability to conceive of what the future may hold. The failure to incorporate radical uncertainty into economic theories was one of the factors responsible for the misjudgments that led to the crisis.[43]

In King's assessment, this is a failure that has yet to be corrected—despite the scale and scope of post-crisis reforms. Nassim Nicholas Taleb's best-selling book on "black swans" makes a similar point: Our perceptions of the world are inherently limited by our experience and tendency to believe that we understand far more about how the world works and what it will look like in the future than is possible given the inherently limited data on which our current understandings are based. As he explains, "Black Swan logic makes *what you don't know* far more relevant than what you do."[44] The crisis helped propel the success of his book because it was such a powerful example of the phenomenon he helps explain. That so many of the post-crisis accounts suggest believing in securitization is equivalent to believing in magic or deny that such structures can produce asset-backed securities that are of a higher quality than the underlying loans—and believe us, they can—exemplifies how core these dynamics are to finance.

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[42] Dan Awrey & Kristin van Zwieten, *The Shadow Payment System*, 43 J. CORP. L. 775, 776–81 (2018) ("[Shadow banking] institutions perform the same core payment functions as conventional deposit-taking banks… [and] reside outside the perimeter of the regulated banking system.").

[43] MERVYN KING, THE END OF ALCHEMY: MONEY, BANKING, AND THE FUTURE OF THE GLOBAL ECONOMY 200 (2016).

[44] NASSIM NICHOLAS TALEB, THE BLACK SWAN: THE IMPACT OF THE HIGHLY IMPROBABLE xxiii (Random House, 2d ed., 2010).

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b. Complexity

A second defining feature of modern finance is its ever-increasing complexity. Economists Jacopo Carmassi and Richard Herring, for example, have shown that the average number of subsidiaries controlled by the largest global banks roughly doubled—to more than 1,000—between 2002 and 2013.[45] Compounding matters, these subsidiaries often operated in different jurisdictions and typically engaged in a wide variety of different activities. As a result, they were often subject to oversight by different regulators who do not necessarily coordinate their regulation or supervision.[46] As Carmassi and Herring explain, these complex and opaque organizational structures both impeded effective ex ante oversight and greatly complicated crisis management and the resolution of failing institutions.[47]

Complexity is also a key feature of many financial instruments. Using lexicographic analysis, Claire Célérier and Boris Vallee examined the term sheets of 55,000 retail structured products issued between 2002 and 2010 to study how these instruments evolved over time.[48] They found that these instruments were getting more complex over time: with average complexity increasing substantially prior to the crisis, leveling off between 2007 and 2009, and then continuing to rise in 2010.[49] They also found that, at least in the retail market, "product complexity is associated with higher product profitability for banks and lower performance for investors."[50]

The proliferation of complex instruments can spur fundamental changes in the structure of the financial system. Securitization illustrates this point. Traditionally, when banks made loans, they held those loans on their balance sheets. Securitization allows banks and other originating creditors to instead bundle these loans together into newly created, bankruptcy remote vehicles. To fund the acquisition of these loans, the vehicles simultaneously issue brand new securities, such as mortgage-backed securities or collateralized debt obligations, which entitle the holder to the cash flows from the underlying loans. These rights are set forth in detailed waterfall provisions that explain how these cash flows will be distributed among the different tranches of issued securities. Because the underlying loans are inherently unique, so too are the intricate waterfall provisions. The detailed representations and warranties pursuant to which those loans are sold from the originating creditors to the securitization vehicle are also unique and can vary significantly. The aggregate impact of these contractual provisions, the creation of new legal entities, and

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[45] Richard Herring & Jacopo Carmassi, *The Corporate Structure of International Financial Conglomerates: Complexity and Its Implications for Safety and Soundnesss*, *in* THE OXFORD HANDBOOK OF BANKING 195, 197–201 (Allen Berger, Philip Molyneux & John Wilson eds., 1st ed. 2012).

[46] *Id.*, 214–16 (describing the complexity of banking regulation and how financial conglomerates might be forced to "adopt a certain amount of corporate separateness for regulatory purposes"); *see also id.* at 209 fig.8.2 (showing the breakdown of subsidiaries of large complex financial institutions).

[47] *Id.*, 216 ("This kind of [regulatory dialectic] has undoubtedly increased the corporate complexity of [large complex financial institutions]. In the event of financial distress, however, this complexity could impede an effective regulatory response.").

[48] Claire Célérier & Boris Vallée, *What Drives Financial Complexity? A Look into the Retail Market for Structured Products* (Harvard Bus. Sch., 2013), https://www.hbs.edu/faculty/conferences/2013-household-behavior-risky-asset-mkts/Documents/What-Drives-Financial-Complexity_Celerier-Vallee.pdf.

[49] *Id.*, 33 fig.3.

[50] *Id.*, 2.

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the appointment of third parties (like a servicer to interact with the borrowers and a trustee to accept cash flows and pay them out according to the waterfall) generates significant new complexities: introducing layers of new information that previously had not mattered to the value of the underlying instruments.[51]

The final point to emphasize is that the complexity of securitization vehicles and the ways they redistributed risks mattered. The complexity also increased—by orders of magnitude—the time, effort, and other costs associated with producing information about the location, nature, and extent of the relevant risks.[52] As then Federal Reserve Governor Randall Krozsner observed during the crisis:

> In the old days, we used to know where the risks were; unfortunately, we knew that they were all on the bank balance sheets. With the originate-to-distribute model and securitizations, we have been able to move to a different model in which the risks are much more dispersed . . . . [I]t leads to potential pockets of uncertainty, and that is exactly what has come up.[53]

This complexity meant that neither market participants nor regulators had a good understanding of how exposures to subprime mortgages were dispersed across the financial system. Nor could they readily produce that information when it really counted. This exacerbated market dysfunction and impeded efforts to contain the growing crisis.[54]

That complexity and the resulting information gaps have only increased in the wake of the crisis speaks volumes about how finance works. The ongoing globalization of finance, the constantly shifting structure of the financial system, and the fact that market participants can often extract rents from greater opacity make complexity endemic to today's financial system.[55] In the view of Simon Levin and Andrew Lo, "[t]he financial system has crossed a threshold of complexity where the system is evolving faster than regulators and regulations can keep pace." [56] This view is echoed by Professor Steven Schwarcz, who argues that complexity is "the greatest financial-market challenge of the future."[57]

c. Unknowns

The complexity of modern finance makes it prohibitively costly for market participants and regulators to gather, much less analyze, the entire universe of potentially

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[51] *See* Kathryn Judge, *Fragmentation Nodes: A Study in Financial Innovation, Complexity, and Systemic Risk*, 64 STAN. L. REV. 657, 690-93; *see also* Larry Cordell, Yilin Huang & Meredith Williams, *Collateral Damage: Sizing and Assessing the Subprime CDO Crisis* (Fed. Res. Bank of Phila. Working Paper No. 11-30/R, 2012), https://www.philadelphiafed.org/-/media/research-and-data/publications/working-papers/2011/wp11-30.pdf.

[52] *See* Robert Bartlett, *Inefficiencies in Information Thicket: A Case Study of Derivatives Disclosures during the Financial Crisis*, 36 J. CORP. L. 1 (2010); Cordell, Huang & Williams, *supra* note 51.

[53] *Minutes of the Federal Open Market Committee*, Sept. 18, 2007, Bd. of Governors of the Fed. Reserve System 86, http://www.federalreserve.gov/fomc/minutes/20070918.htm.

[54] *See* Kathryn Judge, *The First Year*: *The Role of a Modern Lender of Last Resort,* 116 COLUM. L. REV. 843 (2016) [hereinafter Judge, *The First Year*]; Judge, *Information Gaps*, *supra* note 35.

[55] *See* Dan Awrey, *Complexity, Innovation, and the Regulation of Modern Financial Markets*, 2 HARV. BUS. L. REV. 235 (2012).

[56] Simon Levin & Andrew Lo, *Opinion: A new approach to financial regulation*, PNAS (Oct. 13, 2015), http://www.pnas.org/content/pnas/112/41/12543.full.pdf.

[57] Steven Schwarcz, *Regulating Complexity in Financial Markets*, 87 WASH. U. L. REV. 211, 213 (2009).

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relevant information. As a result, these actors almost invariably operate with only a fraction of the information that may be pertinent to the decisions they are making: relying instead on proxies—from ratings to reputation—to fill in the gaps. Dynamism accentuates this challenge. Information that is accurate at one point in time may not be accurate at another. Frictions that limit access to information further exacerbate the pervasiveness and size of information gaps. Counterparties can choose what information they will share, and what they will not. Different regulators have different jurisdictions, mandates and objectives, limiting both the scope of their authority and their field of vision. The creation of the Financial Stability Oversight Council (FSOC) and Office of Financial Research (OFR) in the United States have helped mitigate some of these frictions, but have far from eliminated them. More importantly, given the incredible complexity and dynamism of finance, together with the finite resources of regulators, high information and other costs remain a powerful constraint on who knows what at any point in time.

Apart from these large information gaps, a second factor exacerbating unknowns is uncertainty. Finance is about risk. But as Frank Knight long ago explained, not all future events can be understood in probabilistic terms.[58] Specifically, there are categories of things that might happen—good and bad—that are simply beyond our collective imagination. These are Donald Rumsfeld's "unknown unknowns."[59] These events encompass the "radical uncertainty" about which Mervyn King is concerned. They also encompass changes that are more subtle in character but no less beyond our comprehension. This uncertainty opens the door to the possibility that tomorrow will look very different from today.

As if information gaps and uncertainty were not challenging enough, failures of interpretation can further undermine understanding. It is not just that dynamism renders new information stale—it also undercuts the value of the frameworks we use to interpret this information. Both policymakers and market actors often view information through a lens colored by an outdated understanding of the financial system. As explained by Richard Clarida, now Vice Chair of the Board of Governors of the Federal Reserve: "It would seem that the supervision and regulation of US investment and commercial banks during the great moderation was based on an assumption about how the financial system was supposed to work, not upon sufficient knowledge about how the financial system actually worked."[60] Prior to 2008, policymakers and academics alike were fooled into believing that the system had become more stable at the precise moment that massive new forms of systemic risk were growing unchecked. Banks looked well capitalized, and while regulators were well aware of each of the component parts of the shadow banking system, no one seemed to fully

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[58] *See* FRANK KNIGHT, RISK UNCERTAINTY, AND PROFIT 232–33 (Cosimo Classics 2006) (1957); *see also* MILTON FRIEDMAN, PRICE THEORY 282 (rev. ed. 1976) ("In his seminal work, Frank Knight drew a sharp distinction between risk, as referring to events subject to a known or knowable probability distribution and uncertainty, as referring to events for which it was not possible to specify numerical probabilities." (emphasis omitted)).

[59] Judge, *Information Gaps*, *supra* note 35, 417–18 ("The risk-uncertainty dichotomy is useful because there are tools that can be used to manage risks that are not available when one is confronting an 'unknown unknown.'")

[60] Richard Clarida, What Has – and Has Not – Been Learned about Monetary Policy in a Low Inflation Environment? A Review of the 2000s, 9 (Oct. 12, 2010) (manuscript), https://www.bostonfed.org/-/media/Documents/conference/55/papers/Clarida.pdf?la=en.

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appreciate how the complex interdependencies between these parts exposed them to the same type of destabilizing runs as conventional banks.[61]

The point here is not only that dynamism and complexity create unknowns; it is that economists, policymakers, and others are often ill-equipped to assess what they know and what they do not. This is not a challenge specific to these groups, but rather one common to all experts—and one they regularly fail to appreciate. As Philip Tetlock and Dan Gardiner explain, "absence of doubt" can be detrimental to good decision-making, particularly in complex and changing environments.[62] By failing to appreciate the limits of what is and can be known, current approaches to financial regulation may be discounting the most important features of modern finance.

II. How Finance is Regulated

So how do the complexity, dynamism and unknowns of modern finance compare with the current processes through which finance is regulated? This Part presents a highly simplified, and in many ways stylized, account of these processes. In this respect, our aim is to capture the essence of these processes, rather than their technical nuance.

a. International Financial Regulation

Financial regulation frequently starts at the international level. Beginning in the 1970s, the breakdown of the Bretton Woods system and the increasing globalization of finance spurred the creation of several international organizations designed to foster greater cross-border regulatory coordination. These organizations included the Basel Committee on Banking Supervision, the Committee on Payments and Market Infrastructures, and the International Organization of Securities Commissions. In recent decades, these organizations have come to play an important role in setting international standards in areas such as bank capital, liquidity, and supervision, payment infrastructure, and securities regulation and enforcement.[63] In the wake of the financial crisis, these organizations, alongside the G20 and Financial Stability Board, have often taken the lead in setting the global regulatory agenda.[64]

The Basel Committee on Banking Supervision is among the most influential of these international organizations and embodies the way international financial regulation works today. Created in 1974, members of the Basel Committee include the central bank governors and national bank supervisors of the G20 member states.[65] The Committee's mandate is to strengthen the regulation, supervision, and practices of banks worldwide for

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[61] *See* GARY GORTON, MISUNDERSTANDING FINANCIAL CRISES: WHY WE DON'T SEE THEM COMING (2012); Poszar, *supra* note 28.

[62] PHILIP TETLOCK & DAN GARDNER, SUPERFORECASTING: THE ART AND SCIENCE OF PREDICTION 30 (2016).

[63] For a more detailed description of the different roles played by these organizations, *see* Chris Brummer, *How International Financial Law Works (And How It Doesn't)*, 99 GEO. L.J. 257, 259–60 (2011).

[64] *Id.*

[65] In total, the Basel Committee currently has 45 members from 28 jurisdictions. The Committee also has nine "observers" drawn from central banks, supervisory groups, and other international organizations. Bank of Int'l Settlements, *Basel Committee Membership*, https://www.bis.org/bcbs/membership.htm (last updated Dec. 30, 2016).

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the purpose of enhancing financial stability. Although it purports to provide a three-pillar approach, focused on bank capital, supervision, and market discipline, its rules regarding capital and liquidity are probably the most important in shaping and constraining lawmaking at the national level. The first Basel standards (Basel I) were published in 1988, after almost a decade of protracted negotiations amongst its then ten member states.[66] These were followed by a series of technical amendments leading to the publication of Basel II in 2004.[67] Basel II was itself still being implemented when the crisis prompted a fundamental overhaul of the Basel framework under what would become known as Basel III.[68] Published in 2010, the target date for full implementation of Basel III was originally 1 January 2019.[69]

The role of the Basel Committee in developing global banking standards reflects the work of other international organizations in several key respects. First, these organizations typically enjoy few (if any) formal legal powers: relying instead on negotiation and consensus to develop and promote the adoption of non-binding standards.[70] Second, while politics plays a role shaping their agenda and standard setting, the process by which they develop and refine these standards is highly technocratic.[71] Third, reflecting both the political and technocratic nature of these organizations, the development of these standards is often a slow, deliberative, and incremental process. Finally, despite the absence of formal legal power—or perhaps because of it[72]—these organizations have been relatively successful in promoting the adoption of international standards in a number of important areas. As of 2015, for example, over 80 jurisdictions—including the United States—had announced their intention to adopt one or more of the core elements of Basel II.[73] Ultimately, of course, the power to incorporate these international standards into law still rests in the hands of domestic policymakers.

b. Statutes

In the United States, the backbone of all financial regulation is the U.S. Code. The U.S. Code consists of all of the statutes ever adopted by Congress, including any amendments or modifications to earlier statutes. Title 12 of the Code addresses banks and

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[66] For a more detailed history of the Basel Committee and the negotiations over Basel I, *see* CHARLES GOODHART, THE BASEL COMMITTEE ON BANKING SUPERVISION: A HISTORY OF THE EARLY YEARS 1974-1997 (2011).

[67] *See* Basel Comm. on Banking Supervision, *Basel II: International Convergence of Capital Standards: A Revised Framework*, BANK OF INT'L SETTLEMENTS (Nov. 15, 2005), https://www.bis.org/publ/bcbs118.htm. Significant amendments to Basel I preceding the publication of Basel II included the 1996 "Mark Risk" Amendment. *See* Basel Comm. on Banking Supervision, *Amendment to the Capital Accord to Incorporate Market Risks* (1996), https://www.bis.org/publ/bcbs24.pdf.

[68] *See* Basel Comm. on Banking Supervision, *Basel III: A Global Framework for More Resilient Banks and Banking Systems* (rev. June 1, 2011) (2010) [hereinafter BCBS, Basel III Global Framework], https://www.bis.org/publ/bcbs189.pdf; Basel Comm. on Banking Supervision, *Basel III: Finalising Post-Crisis Reforms* (2017) [hereinafter BCBS, Finalising Post-Crisis Reforms], https://www.bis.org/bcbs/publ/d424.pdf.

[69] *See* BCBS, Basel III Global Framework, *supra* note [68], 69 annex 4.

[70] *See* Brummer, *supra* note 63.

[71] *Id.*

[72] Viewed from this perspective, the fact that these standards are non-binding makes the resulting commitments less costly from the perspective of jurisdictions contemplating their adoption, thereby increasingly the likelihood that they will be adopted. *Id.*

[73] *See* Fin. Stability Inst., *FSI Survey – Basel II, 2.5 and III Implementation* (2015), BANK OF INT'L SETTLEMENTS, https://www.bis.org/fsi/fsiop2015.htm.

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banking, while other core elements of financial regulation, like securities regulation, are codified elsewhere.[74]

The process of making new laws, or modifying existing ones, begins when a member of Congress introduces a bill with her proposed changes to the law. That bill is then referred to a specialized committee, and perhaps from there to a subcommittee. The committee may then hold hearings and discuss the bill, along with others on related matters. A small subset of the bills introduced emerge from this process, and those that do are often modified in the process. A bill that is approved by a majority of committee members is then slated for consideration by the full body. The processes are a little different in the House and Senate, but both generally involve further debate and hearings, possibly followed by a vote. When both chambers do manage to approve similar bills (they usually approve different versions), the next stage involves reconciliation hearings and a compromise text that then must again be approved by a majority of voting members of both houses of Congress. That bill must then be signed into law by the President or, if he vetoes the bill, approved by two-thirds of the voting members of each house.

The aims of these procedures are myriad. The overarching aim of the requirement that laws be passed by democratically elected officials is to promote accountability and responsiveness to the public. The unique form of republican governance embodied in the Constitution then seeks to accommodate the many practical challenges that arise in trying to serve the will of the people. As James Madison explained in *Federalist* No. 51: "In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself."[75] The requirements of bicameral approval and presentment set forth in the Constitution are among the "checks and balances" that help address the fact that government officials are no "angels."[76] The use of committees and other procedural rules also serve a number of other aims: from allowing Congress to more effectively manage the many issues subject to federal regulation to enabling some degree of specialization among members.[77] Lawmaking has never been about a first-best process, but one that entails a range of tradeoffs.

The frictions that arise from these checks and balances are considerable and, in practice, have grown in recent years.[78] These frictions are exacerbated by the use of committees and other procedures. Political scientists have conceptualized the process using a "vetogate model" that highlights the numerous points at which a potential bill can be derailed.[79] Unorthodox legislation, from emergency legislation passed with far less process or

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[74] For example, most federal securities laws administered by the Securities and Exchange Commission are included in Title 15 of the U.S.C., whereas the authority of the Commodity Futures Trading Commission is generally contained in Title 7 of the U.S.C.

[75] THE FEDERALIST NO. 51 (Alexander Hamilton or James Madison).

[76] *Id.*

[77] Herbert Asher, *Committees and the Norm of Specialization*, ANNALS AM. ACAD. POL. & SOC. SCI., Jan. 1974, at 63, https://journals.sagepub.com/doi/abs/10.1177/000271627441100106.

[78] *See* Derek Willis & Paul Kane, *How Congress Stopped* Working, PROPUBLICA (Nov. 5, 2018), https://www.propublica.org/article/how-congress-stopped-working.

[79] *See* William Eskridge et al., CASES AND MATERIALS IN LEGISLATION AND REGULATION: STATUTES AND THE CREATION OF PUBLIC POLICY 53–55 (West Acad. Pub., 5th ed. 2014); William Eskridge, Jr., *Vetogates and American Public Law*, 31 J.L. ECON. & ORG. 756 (2012), https://academic.oup.com/jleo/article-abstract/31/4/756/2492402?redirectedFrom=fulltext.

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debate to "long and messy" omnibus bills, is increasingly common.[80] By the same token, legislative vetoes in which Congress effectively overrides the Supreme Court's interpretation of a statute—a sign that Congress is functioning effectively—are on the decline.[81] And perhaps most discussed, though still contested, is the way increased partisanship may be hampering Congress's capacity to get anything done.[82] Nonetheless, these processes remain deeply embedded and recent developments seem more likely to exacerbate than reduce these tensions.

c. Rulemaking

Today, most statutes are not complete or self-executing proclamations of the law. Instead, they delegate significant authority to administrative agencies to make rules and otherwise implement the regimes set forth in statute. The Dodd–Frank Act is a case in point. It is a detailed, prescriptive piece of legislation, totaling 849 pages.[83] Within that text, however, Congress also explicitly requires eleven different agencies to produce, collectively, 243 new rules, 67 one-time reports, and 22 new periodic reports.[84] Among the reasons for this delegation is the desire to harness the technocratic expertise housed within the federal agencies responsible for administering, monitoring and enforcing financial regulation.

Like statutory law, the process of introducing or modifying regulations involves numerous procedural requirements. Most of the default procedures that agencies must follow are set forth in the Administrative Procedure Act (APA).[85] The APA requires that before implementing or modifying a regulation, an agency generally must publish its proposed rule, along with background and explanatory materials, and invite public comment on that proposal.[86] For matters of financial regulation, the most thorough and relevant letters are often provided by banks and other financial market participants who will be subject to the regulation.[87] The agency will then respond to the substantive issues raised in those comment letters when issuing its final, often revised, rule.

Like statutory lawmaking, these processes serve numerous purposes. According to Cass Sunstein: "Democratization of the regulatory process, through public comment, has an epistemic value. It helps to collect dispersed knowledge and to bring it to bear on official choices."[88] In addition to being aimed at improving the quality of the rules finally issued,

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[80] *See* Abbe Gluck, Anne Joseph O'Connell & Rosa Po, *Unorthodox Lawmaking, Unorthodox Rulemaking*, 115 COLUM. L. REV. 1789 (2015).

[81] Matthew Christiansen & William Eskridge, Jr., *Congressional Overrides of Supreme Court Statutory Interpretation Decisions, 1967–2011*, 92 TEX. L. REV. 1317 (2014).

[82] Sam Rosenfeld, THE POLARIZERS: POSTWAR ARCHITECTS OF OUR PARTISAN ERA (2018); Thomas E. Mann, *Admit It, Political Scientists: Politics Really Is More Broken Than Ever*, THE ATLANTIC (May 26, 2014), https://www.theatlantic.com/politics/archive/2014/05/dysfunction/371544/.

[83] Dodd–Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 123 Stat. 1376, (2010) (codified as amended in scattered sections of 12 and 15 U.S.C.).

[84] Davis Polk, *supra* note 3, ii.

[85] *See generally* Administrative Procedure Act, Pub. L. No. 79-404 60 Stat. 237 (1946) (APA) (codified as amended in scattered sections of 5 U.S.C.).

[86] 5 U.S.C. § 553 (2018).

[87] Kimberly Krawiec, *Don't "Screw Joe the Plumber": The Sausage-Making of Financial Reform*, 55 ARIZ. L. REV. 53 (2013).

[88] Adam Looney, *How to Effectively Comment on Regulation*, BROOKINGS INST. (Aug. 2018), https://www.brookings.edu/wp-content/uploads/2018/08/ES_20180809_RegComments.pdf.

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this extensive and resource-intensive process is also designed to enhance transparency and accountability, allowing the public to participate in and understand the reasons behind agency rulemaking.

Just as with legislation, there is evidence that the regulatory state often deviates from this stylized model. Indeed, there is a growing chorus of administrative law scholars drawing attention to the ways these procedures may actually inhibit effective regulation. Perhaps most importantly, adherence to strict procedural rules ostensibly designed to confer legitimacy and improve substantive rulemaking may exhibit a pronounced status quo bias. Compliance with procedural requirements almost by necessity involves delaying regulatory action. It also saps agency resources, making it more difficult for them to take the initiative and respond to new developments. When combined with the nature and pace of change in fields such as finance, this status quo bias is not politically neutral. Rather, these procedural requirements can tip the political scales in favor of those who wish to limit state intervention—undercutting the legitimacy of the regulatory process and foreclosing potentially desirable policy alternatives. As Nicholas Bagley argues, the procedural "fetish" in U.S. administrative law may thus undermine the very aims it was designed to achieve.[89] In part because of these concerns, other administrative law scholars are laying a critical foundation for thinking more broadly about the type and site of procedures that can confer the needed accountability.[90] Nevertheless, this procedural framework remains mandatory and entrenched.[91]

Compounding matters, financial regulators often do, and sometimes must, undertake cost-benefit analyses (CBA) of proposed regulations.[92] In addition to shaping the nature of an agency's deliberations, CBA can add significant costs and introduce other impediments to the rulemaking process.[93] Even where it is not strictly followed, CBA also reflects an extreme version of the assumption underlying so many of the procedural rules used in financial regulation: that it is possible to know, or at least make reasonably well-informed assessments of, the myriad effects a regulatory intervention will have on financial markets and institutions. That leading academics in the law and economics movement have decried CBA as counterproductive in the domain of financial regulation suggests that processes that may sound reasonable and helpful in the abstract can be misguided when applied formulaically in the process of regulating finance.[94] Again, however, those processes remain entrenched and are supported by many.

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[89] Nicholas Bagley, *The Procedure Fetish*, 118 MICH. L. REV. (forthcoming 2019).

[90] Gillian Metzger & Kevin Stack, *Internal Administrative Law*, 115 MICH. L. REV. 1239 (2017).

[91] *See* Gluck, O'Connell & Po, *supra* note 80; David Zaring, *Administration by Treasury*, 95 MINN. L. REV. 187 (2010).

[92] Rules issued by executive agencies undergo CBA overseen by the White House Office of Information and Regulatory Affairs before being submitted to the public for comment. Exec. Order. No. 12866, 58 Fed. Reg. 51,735 (Oct. 4, 1993). Most financial regulators are independent and hence not subject to this requirement, but some commentators and courts take the position that certain financial regulators are required to undertake quantified, judicially reviewable CBA when promulgating new rules. John Coates provides helpful background and a very useful critique of such requirements. *See genereally* John Coates, *Cost-Benefit Analysis of Financial Regulation: Case Studies and Implications*, 124 YALE L. J. 882 (2015).

[93] *See* Coates, *supra* note 92, at 888.

[94] *See id.* at 888–89; *see also* Jeffrey Gordon, *The Empty Call for Benefit-Cost Analysis in Financial Regulation*, 43 J. LEGAL STUD. S351 (2014).

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A final source of friction that is particularly pressing in finance arises from the architecture of the regulatory system.[95] In the United States, this architecture is a byproduct of a time when banking, capital markets, and insurance were largely distinct. This historical anachronism has left the United States with two federal market regulators, three federal bank regulators, and no federal regulation of insurance (which instead is overseen primarily by the fifty states). There are also a number of specialized regulators, such as the Federal Housing Finance Agency, which oversees the government-sponsored entities that provide support to U.S. housing markets. Sometimes, new rules are promulgated by multiple agencies working together. The Volcker Rule, for example, required coordination among five different agencies and moved forward more slowly as a result. More often, each agency continues to shape how it perceives and addresses challenges, and most agencies remain focused on problems that fall clearly within their jurisdiction, thereby reducing the amount of attention paid to developments within the financial system as a whole or the ways actions by one agency may cause problems under the domain of others.[96]

d. Supervision

In addition to being subject to the many rules promulgated through the processes described above, banks and many other financial institutions are subject to ongoing supervision. Supervisors assess compliance with applicable regulations, but they have also long enjoyed a broader mandate to promote the "safety and soundness" of supervised entities. This seemingly broad authority is justified both on the grounds that the Federal Deposit Insurance Corporation (FDIC) insures deposits at all regulated banks and that bank failures have adverse spillover effects. After the recent crisis, there have also been efforts, most notably through regular stress testing, to make bank oversight and the rules to which banks are subject more dynamic and forward looking. As will be discussed further, these are important components of financial regulation, and ones that can help mitigate the mismatch between the dynamism of finance and the efforts to govern it using static rules.

Despite its seeming breadth and flexibility, supervision is mentioned last and only briefly because, in practice, it serves more to implement than complement current regulatory frameworks. As the trajectory of financial regulation in the United States has been one of producing ever more finely-tuned rules through the processes just described, supervision has evolved from a tool that gave regulators broad discretion to identify emerging problems to a process that is too often focused on ensuring the trees are in order without much attention to the broader forest of which they are a part.[97] This was all too clear both before and after the recent crisis. And, supervisors are among the most likely to be using outmoded frames for understanding the risks before them, limiting the practical

[95] On the fragmented nature of the U.S. regulatory scheme and its impact on rulemaking generally, *see* Jody Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 HARV. L. REV. 1131 (2012).

[96] For more on how this came to be, *see generally* Judge, *Information Gaps*, *supra* note 35. Also it is important to note that these divisions and biases can often persist through personnel and intra-organizational design, even when the regulatory architecture is redesigned to try to address these dynamics.

[97] For a further discussion of the reasons that rules are used so extensively despite known weaknesses in their efficacy, *see infra* Part IV.

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benefits stemming from the potential breadth and flexibility of supervision right when these traits are most needed.[98]

e. Where does this leave us?

Underpinning the costly, complex, and lengthy processes governing how financial regulation is currently made in the United States and elsewhere are two key policy objectives. One is to promote legitimacy and accountability. The second is to ensure that new rules will be effective: that they will achieve a desired aim, and, ideally, that they are well-tailored to that aim.

Moving the dynamism, complexity, and unknowns of modern finance centerstage, however, reveals how ill-suited these processes are to achieve those aims. As a threshold matter, these processes are only triggered when there is a perceived problem. Sometimes this is a shortcoming exposed by a scandal or crisis, other times it is regulated actors or other affected parties who are advocating for a change.[99] Economists, together with the more technocratic policymakers they seek to inform, use different language, but often similarly focus on problems in isolation. "Market failures" are their diagnostic tool of choice: placing problems into established frameworks such as agency costs, information asymmetries, coordination problems, or externalities.[100]

By focusing on specific market failures or other perceived flaws, this approach often results in discussions of issues divorced from the broader ecosystem within which they are situated. The net result is a policy process that too often ignores the complex interconnections between financial markets and institutions, the potential second, third, and fourth order effects of regulatory intervention, and the limits of what policymakers can and do know and understand. In short, current processes do not encourage, and may well discourage, attention to the bigger picture.

Accentuating the challenge, the collective inertia generated by these procedural requirements introduces a significant status quo basis into the policy process. Finance moves faster than financial regulation, and the procedural requirements meant to promote the public interest can be used by regulated actors to influence the direction of the policy process

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[98] See Clarida, *supra* note 60, 27 (explaining the problems arising from "the pre–crisis consensus for the supervision and regulation of financial markets by the Fed, … the SEC, FDIC, Comptroller of the Currency, [and] OFHEO (now FHFA)").

[99] Whether and to what extent financial crises drive regulation is a matter of contestation. *Compare* Roberta Romano, *Regulating in the Dark and a Postscript Assessment of the Iron Law of Financial Regulation*, 43 Hofstra L. Rev. 25 (2014) (arguing that "foundational financial legislation tends to be enacted in a crisis setting") *with* Peter Conti-Brown and Michael Ohlrogge, *Testing The Crisis-Legislation Hypothesis: Citation Indexing and the Measurement of Legislative Importance* (working paper, 2019) (empirically challenging Romano's assessment and empirically showing that a significant portion of banking regulation is in fact enacted outside of crisis periods).

[100] These market failures are the subject of an enormous body of economic scholarship. *See, e.g.,* George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970) (describing information and adverse selection problems); R. H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960) (describing the concepts of public goods and externalities); Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305 (1976) (describing agency problems in the context of firms); Oliver E. Williamson, *Credible Commitments: Using Hostages to Support Exchange*, 73 AM. ECON. REV. 519 (1983) (describing asset-specific investment and the resulting hold-up problems).

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in self-serving ways. The status quo bias generated by these procedural requirements thus typically has a decidedly deregulatory impact.

Lastly, where the policy process does result in the introduction of new rules, current processes envision that these rules will in place regardless of whether the specific problems they were designed to address remain. Absent further intervention, new regulation remains in perpetuity. And where new problems do emerge, they are typically addressed through new interventions—that is, new rules. Importantly, the resulting accretion of rules can even be observed during periods of supposed "deregulation." As Helen Garten has depicted, much of the deregulation that occurred in banking in the 1980s took the form of increasingly detailed and more expansive rules, each permitting banks to do a little more than they were previously able to do, subject to yet additional restrictions on where within their organizations they could undertake new activities.[101] Paradoxically, deregulation has thus increased the complexity of both financial institutions and financial regulation.[102]

III. Financial Regulation in Practice

Our discussion thus far has taken place at a fairly high level of abstraction. Yet even at this level, there appears to be a meaningful tension—a mismatch—between the core features of the financial system as a domain characterized by complexity, change, and pervasive unknowns, and regulatory processes that assume a high degree of knowability, stability, and predictability in designing rules that are both effective and legitimate in the eyes of the public.

This Part moves us closer to the ground in order to demonstrate that this mismatch is not just some theoretical problem, but a concrete and pressing challenge. It begins with two case studies. The first involves rulemaking by the U.S. Securities and Exchange Commission (SEC) in response to the runs on money market funds at the height of the financial crisis. The second involves the sweeping post-crisis reforms to the international capital and liquidity rules for banks spearheaded by the Basel Committee. To address the concern that we have cherry picked these examples, this Part concludes by looking at how similar challenges are afflicting other post-crisis reforms. The aim is not to critique the individual reforms examined, but rather to assess the extent to which the extensive processes through which they were developed achieved the aims those processes were meant to achieve.

a. Money market mutual fund reform

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[101] HELEN GARTEN, WHY BANK REGULATION FAILED: DESIGNING A BANK REGULATORY STRATEGY FOR THE 1990S (1991).

[102] This trend is not unique to finance. Joseph D. Kearney & Thomas W. Merrill, The Great Transformation of Regulated Industries Law, 98 Colum. L. Rev. 1323, 1325 (1998) (arguing that "the changes taking place in regulated industries law" during the 1980s and 1990s are better understood as a change of paradigm than "in terms of 'regulation' versus 'deregulation,'" as much of the supposed deregulation, like the Telecommunications Act of 1996, which included more than "100 pages of new regulatory requirements [and] directs the Federal Communications Commission (FCC) to commence more than a dozen rulemaking proceedings," did not result in less regulation in the colloquial sense of the term).

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Money market mutual funds—or simply "money market funds" —are investment funds that invest in cash and other money market instruments. As the name suggests, these funds provide investors with a "money-like" investment: one that is safe and can be relied on to hold its value. The existence of these funds is a byproduct of idiosyncrasies in how the United States historically regulated banks and markets. Following the Great Depression, Congress introduced deposit insurance for banks, while also imposing significant restrictions on what banks could do and how they could do it. This included restrictions, embodied in Regulation Q, on the interest rates that banks could pay depositors.[103] This system worked well for several decades.[104] When interest rates rose significantly in the 1970s, however, depositors were less content accepting little or no interest in exchange for the safety and liquidity that bank deposits promised.[105] Money market funds emerged to fill this gap. A product of both private creativity and an accommodating regulatory environment, money market funds offered higher returns than bank deposits. They grew quickly, to the detriment of banks' liquidity positions, leading in turn to the demise of Regulation Q. Nonetheless, because banks were still subject to costly regulation, demand for money market funds continued to grow. Throughout, money market funds were aided by SEC regulations that permitted them to use a fixed $1.00 net asset value (NAV) in exchange for abiding by significant restrictions on the duration and quality of the assets they were allowed to hold.[106]

Over time, the growth of money market funds changed how banks and other firms funded themselves, as highly rated issuers came to rely on them as ready buyers of any short-term debt they might issue.[107] All seemed well enough until the failure of Lehman Brothers in September 2008. Lehman's collapse caused one of the oldest money market funds to "break that buck": to redeem some of its shares at less than the expected $1.00. Within a week, investors had withdrawn approximately $300 billion from non-government (or "prime") money market funds, leading to massive disruptions in the short-term funding markets.[108] The Federal Reserve and Treasury Department quickly intervened, with each creatively stretching their legal authority to do so.[109] These interventions, particularly the

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[103] *See* 12 C.F.R. § 217.1 (2010).

[104] Gorton, supra note 61, [XX]; Kathryn Judge, *Regulation and Deregulation: The Baseline Challenge*, 104 VA. L. REV. ONLINE 101 (2018) n.26 [hereinafter Judge, *Regulation and Deregulation*], http://www.virginialawreview.org/volumes/content/regulation-and-deregulation-baseline-challenge#top-link-26.

[105] Paul G. Mahoney, *Deregulation and the Subprime Crisis*, 104 Va. L. Rev. 233, 236 (2018); Judge, *Regulation and Deregulation*, *supra* note 104, 107 n.26, http://www.virginialawreview.org/volumes/content/regulation-and-deregulation-baseline-challenge#top-link-26.

[106] *See* 17 C.F.R. § 270.2a-7 (1984).

[107] Jeffrey Gordon, *Letter to the SEC on Money Market Fund Reform* (Columbia Law & Econ. Working Paper No. 352, 2009), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1473275.

[108] *Fact Sheet: Reforming Money Market Funds*, SEC. & EXCH. COMM'N (June 5, 2013), https://www.sec.gov/opa/Article/press-release-2013-101---related-materials.html.

[109] For instance, the Federal Reserve has no formal authority to insure debt, yet it effectively did just that with the creation of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) in September 2008. *See Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility*, BD. OF GOVERNORS OF THE FED. RESERVE SYS., https://www.federalreserve.gov/monetarypolicy/abcpmmmf.htm (last updated Feb. 5, 2010). To implement this program, the Fed invoked its emergency lending authority under section 13(3) of the Federal Reserve Act, despite this provision containing no basis for the Fed to provide guarantees for financial instruments. *See* 12 U.S.C. § 343(3) (2012); *see also* Kathryn Judge, *Guarantor of Last*

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guarantees provided by Treasury, had the desired effect of restoring faith in money market funds and restoring functionality to short-term funding markets. That the government had to take such extreme action, however, was a red flag suggesting the need for reform.[110]

The Dodd-Frank Act did not address money market funds, as the SEC already had sufficient authority to address the challenges revealed during the crisis. When the SEC failed to take meaningful action, the FSOC took the unusual step of seeking public comment on ways to reform money market funds.[111] This move was designed to, and had the effect of, prompting the SEC to pursue more substantive reforms.

In June 2013, nearly five years after the 2008 run on money market funds and after policymakers had expended significant resources assessing how best to proceed, the SEC issued a proposed notice of rulemaking. The proposal was 693 pages and included 1,248 footnotes.[112] Its focus was on how to reform the "prime" money market funds held by large institutional investors.[113] The SEC received 1,400 comment letters and engaged in numerous meetings with industry and other stakeholders over the following year. Although 1,200 of those letters were form letters,[114] the remainder were individualized, and often exceptionally detailed. They included letters from industry participants, trade groups, and law firms, as well as nonfinancial firms, academics, and others. Public records reveal 108 separate meetings or phone calls between SEC commissioners or staff, on the one hand, and stakeholders, including SIFMA, Goldman Sachs, Vanguard, Blackrock, the AFL-CIO, Better Markets, and UPS, on the other hand.[115] In short, a lot of effort was invested in this process.

The SEC issued its final rule just over a year later. The final rule, together with supporting material, was 893 pages long and included 2,530 footnotes.[116] It was detailed and, in some regards, exceptionally thorough. In the process of explaining its reasons for the final rule, the SEC addressed the myriad and often conflicting views that had been expressed in the comment letters received regarding the probable effects of the reforms.

In the Final Release, the culmination of years of effort and analysis, the SEC stated its "belie[f] that the reforms … should … lessen money market funds' susceptibility to heavy

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Resort, 97 TEX. L. REV. 708, 727–34 (2018) (describing how various government institutions, including the Federal Reserve and the Treasury Department "had to stretch their formal authority to achieve a desired aim").

[110] William Dudley, *For Stability's Sake, Reform Money Funds*, BLOOMBERG OPINION (Aug. 14, 2012), https://www.bloomberg.com/opinion/articles/2012-08-14/for-stability-s-sake-reform-money-funds; Jeffrey Gordon, *Why Investors Should Worry About Money Funds*, WALL STREET J. (June 3, 2011), https://www.wsj.com/articles/SB10001424052702304520804576343093940388186.

[111] Press Release, *Financial Stability Oversight Council Releases Proposed Recommendations for Money Market Mutual Fund Reforms*, U.S. DEPT. OF TREASURY (Nov. 13, 2012), https://www.treasury.gov/press-center/press-releases/Pages/tg1764.aspx.

[112] Money Market Fund Reform; Amendments to Form PF, Release No. IC-30551 (proposed June 5, 2013), https://www.sec.gov/rules/proposed/2013/33-9408.pdf.

[113] *Id.*

[114] Comments on Proposed Rule: Money Market Fund Reform; Amendments to Form PF, Release Nos. 33-9408 (last updated July 23, 2014), https://www.sec.gov/comments/s7-03-13/s70313.shtml.

[115] *Id.*

[116] This describes the rule as made available via the SEC's website at https://www.sec.gov/rules/final/2014/33-9616.pdf. The official version published in the Federal Register is far denser, and hence comes in at a mere 250 pages.

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redemptions, improve their ability to manage" the associated contagion, "and increase the transparency of their risks, while preserving, as much as possible, the benefits of money market funds." It then went on to explain why. "Market discipline" received significant attention, including 17 separate mentions. The SEC "agree[d] with commenters and believe that daily disclosure [that is, a floating NAV] will increase market discipline, which could ultimately deter situations that could lead to heavy redemptions."[117] The hope was that if money market funds provide more detailed information about the value of their assets, and that even small value changes affect the price investors receive when redeeming their shares, those investors would pressure mutual fund managers to be more conservative in their holdings, reducing the risk and the likelihood of future runs.

The SEC and numerous letter writers also acknowledged the possibility of broader, systemic ramifications. One big question was whether institutional investors would continue to hold prime money market funds once the changes, like floating NAVs, were implemented. The SEC identified more than a dozen alternative instruments that institutional investors might choose instead of money market funds. It ultimately concluded that "some outflow" was likely but it was "not able to estimate" how much. "Given the heterogeneity of investors' preferences and investment objectives and constraints, we *do not expect* that all investors will allocate assets to the same alternative."[118] In short, they expected that the changes would cause some investors to seek out substitutes, but they couldn't hazard a guess as to how many, and they thought that different investors would seek different alternatives. They reached an even more equivocal non-conclusion regarding the macroeconomic effects of the reforms.[119]

In hindsight, it is notable that the Federal Home Loan Banks (FHLBanks) were mentioned only once in the entire Release. Specifically, the FHLBanks were mentioned in a footnote identifying the various types of securities in which government money market funds—not "prime" funds—are permitted to invest."[120] The FHLBanks, like Fannie Mae and Freddie Mac, are government-sponsored enterprises created after the Depression to facilitate home ownership. Today, the primary way the FHLBanks purport to do this is by making loans to member banks and insurance companies collateralized by mortgage-related assets. The FHLBanks fund these loans by issuing debt through the FHLBank Office of Finance, for which all of the FHLBanks are jointly liable. The federal government does not explicitly guarantee the debt they issue, but it is widely believed that the government would step in to protect that debt if needed.[121] Because investors had run into—rather than out of—government money market funds in 2008, the SEC had not seen any reason to revise the rules governing those funds, which could still use the $1.00 fixed NAV. This was the picture of what years of dialogue and input from government bodies, industry, think tanks, and academics had produced. This was the process that was meant to improve the quality

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[117] Money Market Fund Reform; Amendments to Form PF, 79 Fed. Reg. 47,736, 47,828 (Aug. 14, 2014) (codified at scattered parts of 7 C.F.R.).

[118] *Id.*, 47,911 (emphasis added).

[119] *Id.*, 47,910 ("[W]e acknowledge changes in the market arising from the reforms may have macroeconomic effects in the future" but "[b]ecause we cannot foresee all of the ways markets will evolve, we cannot predict [those]… effects.").

[120] *Id.*, 47,904 n.1893.

[121] For more information about the history of the FHLBanks, what they do, and how they have evolved, *see* Kathryn Judge, *Three Discount Windows*, 99 CORNELL L. REV. 795 (2014).

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of the final rule and ensure its legitimacy by allowing robust and public discussion of the issues at stake.

The new rules became effective two years after being finalized, in October 2016. The response of investors was immediate and unequivocal. At the beginning of 2014, before the reforms were finalized, there was nearly $950 billion invested in the prime money market fund affected by the reforms.[122] By the time the rule was fully implemented that number had plummeted to just over $120 billion.[123] It turns out that the features the SEC identified as making money market funds vulnerable were ones that most investors were not willing to forego. However, rather than turning to a diverse array of alternatives as the SEC had predicted, virtually all of those funds moved into the exact same alternative: government money market funds not subject to the new rules.[124] The total assets invested money market funds thus remained fairly constant; it is the allocation of these assets among those funds that changed dramatically.

The spike in flows into government money market funds was made possible by a dramatic increase in the issuance of short-term debt instruments by the FHLBanks. Between the end of 2015 and the end of 2017, the value of short-term floating notes issued by the FHLBank system increased from $80 billion (8.9% of total bonds and notes outstanding) to $297 billion (29.2%). In other words, the FHLBanks more than tripled their reliance on the type of short-term debt most useful to money market funds.[125] Because most of the loans they issue are of a longer duration, this exposed FHLBanks to a greater maturity mismatch on their balance sheets. The size of their balance sheets also grew.[126] This was in part a response to the increased demand for FHLBank debt arising out of spurred reforms, but also to new liquidity requirements imposed on banks that increased their demand for longer term funding of the kind the FHLBanks can provide.[127] There was thus an interaction between the SEC's reforms and the new rules promulgated by the Basel Committee and implemented by the Federal Reserve that collectively brought about changes on both sides

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[122] Data supplied by the Investment Company Institute (ICI) to the authors. A number of other sources understate the full effect of the rule by relying on SEC data that breaks money market funds into three categories, prime, government and tax-exempt. Nellie Liang, *Why Congress Shouldn't Roll Back the SEC's Money Market Rules*, BROOKINGS INST. (Jan. 12, 2018), https://www.brookings.edu/blog/up-front/2018/01/12/why-congress-shouldnt-roll-back-the-secs-money-market-rules/; Catherine Chen et al., *Money Market Funds and the New SEC Regulation*, FED. RES. BANK OF N.Y. LIBERTY STREET ECON. (March 20, 2017), https://libertystreeteconomics.newyorkfed.org/2017/03/money-market-funds-and-the-new-sec-regulation.html; U.S. SEC. & EXCH. COMM'N, *Money Market Fund Statistics* (Sept. 20, 2017), https://www.sec.gov/divisions/investment/mmf-statistics.shtml. The challenge is that prime funds held by retail investors were not affected by the reforms, hence there was little change in the value of such funds outstanding. The more granular data from the ICI makes this plain.

[123] ICI data (on file with the authors).

[124] BD. OF GOVERNORS OF THE FED. RESERVE SYS., FINANCIAL STABILITY REPORT 33 fig.4-4 (Nov. 2018), https://www.federalreserve.gov/publications/files/financial-stability-report-201811.pdf; Liang, *supra* note 122.

[125] Claude Lopez et al., *Macroprudential Policy and Financial Stability: Where Do We Stand*, MILKEN INST. 17 (March 2018), https://assets1c.milkeninstitute.org/assets/Publication/ResearchReport/PDF/MI-Macroprud-Policy-WEB-FINAL.pdf.

[126] *Id.*, 18.

[127] Banks' increased demand for FHLBank advances came, in part, from large banks now having to comply with new liquidity requirements. The two outcomes are codetermined, however, in the sense that the increased demand for FHLBank liabilities reduces their funding costs, enabling them to provide advances to banks on more attractive terms. *See id.*, 17.

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of the balance sheet of the FHLBank system. Needless to say, the FHLBanks are overseen by the Federal Housing Finance Authority, thus falling outside the jurisdiction of both the SEC and the bank regulators responsible for implementing the new liquidity rules.

Putting these pieces together, the net effect of the SEC's reforms has thus far been to position the FHLBanks between banks and money market funds. Instead of raising capital by issuing short-term debt that was then held by money market funds, banks today borrow more from FHLBanks, which then loan the money onto banks. Thus, rather than increasing market discipline, the reforms seem to have reduced it. Additionally, the reforms have contributed to a FHLBank system that is both larger and—owing to the greater maturity mismatch—more fragile. Institutional investors now generally hold government money market funds instead of prime funds, but otherwise hold effectively the same product as they did before the reforms.[128]

The effects of the SEC's reforms are thus mixed. Money market funds probably are more stable. Yet this has happened in significant part by increasing the government footprint. Government guarantees, even if implicit, often help enhance stability. But they can also undermine market discipline and make taxpayer losses more likely. The increased size and fragility of the FHLBanks also raise a host of questions about their oversight and operations.[129]

Our aim here is not to resolve these policy questions, but to point out that these are among the most important, and contestable, questions raised by the actual effect of the SEC's reforms. Nonetheless, they were not among the many, many issues debated by policymakers, industry participants, and other stakeholders before the reforms were adopted. Despite the years of study and debate, the possibility that the FHLBank system would grow, evolve, and assume additional risks to satisfy new demand for government money market funds was not even mentioned in the nearly 900 pages and 2500 plus footnotes of the Final Release.

It would be easy to fault the SEC for this.[130] But the SEC was not alone in its failure. One aim of the lengthy, resource-intensive process the SEC undertook before adopting the reforms was to provide it with insights from market participants, academics, and other stakeholders. The materials they provided were voluminous and detailed, and yet they too seem to have missed the mark. The lack of discussion of these ultimately pivotal issues is thus a failure of the processes meant to inform the SEC, not one specific to the institutional competence of the SEC itself.

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[128] The magnitude of the decline has been moderated both by the fact that most have shifted into government funds that are relatively more risky (those holding agency debt like that issued by the FHLBanks rather than just Treasuries), and by the way the FHLBanks' increased issuance of short-term instruments may have helped mute a decline in the return on eligible instruments as a result of the increased demand. Stefean Gissler & Gorghan Narajabad, *The Increased Role of the Federal Home Loan Bank System in Funding Markets, Part 2: Recent Trends and Potential Drivers*, BD. OF GOVERNORS OF THE FED. RES. SYS. (Oct. 18, 2017), https://www.federalreserve.gov/econres/notes/feds-notes/the-increased-role-of-the-federal-home-loan-bank-system-in-funding-markets-part-2-20171018.htm.

[129] *See* Stanley Fischer, *An Assessment of Financial Stability in the United States*, Remarks, BANK FOR INT'L SETTLEMENTS (June 27, 2017), https://www.bis.org/review/r170704b.pdf.

[130] In particular, the SEC seems to have viewed the situation as a market regulator without an adequate appreciation of why and how much some investors value "money-like" claims. *See* Judge, *Investor-Driven Innovation*, *supra* note 36, 307–12.

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Also noteworthy is the fact that—now that we have high-quality, accurate information about the impact of these reforms—the window for discussion is largely closed. Some policymakers, researchers and think tanks have drawn attention to these dynamics, but there is little concerted discussion of whether the changes wrought by the SEC's reforms are desirable—let alone whether they demand a further regulatory response. The frictions that would impede any change to the new rules, along with exhaustion from the effort already expended, are likely among the factors contributing to this inertia.

Before leaving this case study, it is worth emphasizing the relevance of the events leading up to the crisis to our analysis. Money market funds were a core component of the shadow banking system and enabled that system to use short-term money-like liabilities to fund longer term illiquid assets like home loans. They did not grow in the "shadows" in the sense of being out of sight. Their growth was widely observed, discussed, and facilitated by SEC regulations.[131] They were in the shadows only in the (very important) sense of being outside the perimeter of the prudential regulatory regime governing banks and other institutions known to pose systemic risks. This was both because of, and a contributing factor to, the failure of policymakers to appreciate their systemic significance.

b. The Basel capital and liquidity requirements

Shifting from shadow banks to banks provides further insight into how dynamism, complexity and unknowns contribute to a fundamental mismatch between finance and financial regulation. Capital requirements—rules governing how banks finance their activities—have long been a cornerstone of bank regulation. The basic function of these requirements is simple. Because equity can absorb losses, utilizing more equity makes banks better able to withstand declining asset prices, thus reducing both the probability and potential impact of bank failure. Thicker capital cushions may also help to assure depositors and other short-term creditors of a bank's health, reducing the probability of a run.[132]

In practice, however, there are several reasons why shareholders and managers may prefer debt over equity.[133] First, to paraphrase Gary Gorton, issuing short-term debt like deposits is not just how banks fund themselves, it is their product—it is what they are designed to do.[134] Second, debt often enjoys certain tax advantages.[135] Third, shareholders may seek to use debt—and short-term debt in particular—as a commitment mechanism to help address potential agency problems vis-à-vis bank managers.[136] Fourth, bank managers may prefer debt because it mechanically increases a bank's return on equity, a common metric for performance-based compensation. Finally, and perhaps most importantly, explicit and implicit government backing for the debt banks issue can lower the cost of debt relative

[131] *See* Paul Mahoney, *Deregulation and the Subprime Crisis*, 104 VA. L. REV. 235 (2018).

[132] Charles W. Calomiris & Gary Gorton, *The Origins of Banking Panics: Models, Facts, and Bank Regulation, in* FINANCIAL MARKETS AND FINANCIAL CRISES 109 (R. Glenn Hubbard ed., 1991).

[133] For a more comprehensive analysis of why bank shareholders and managers may prefer debt to equity, *see* Anat Admati & Martin Hellwig, THE BANKERS' NEW CLOTHES: WHAT'S WRONG WITH BANKING AND WHAT TO DO ABOUT IT (Princeton U. Press, rev. ed., 2013).

[134] Gary Gorton, *The Development of Opacity in U.S. Banking*, 31 YALE J. ON REG. 825 (2014).

[135] *See generally* Mark Roe and Michael Tröge, *Containing Systemic Risk by Taxing Banks Properly*, 35 YALE J. ON REG. 181 (2018).

[136] *See* Charles Calomiris & Charles Kahn, *The Role of Demandable Debt in Structuring Optimal Banking Arrangements*, 81 AM. ECON. REV. 497 (1991).

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to equity.[137] Viewed from this perspective, minimum capital requirements serve as a counterweight against the incentives of shareholders, managers, and creditors to operate with dangerously low levels of loss absorbing capital. They mitigate the moral hazard generated by the expectation of government support and help address the fact that the government can never credibly commit not to support banks given the massive costs that banking panics can impose on the real economy.

The first international capital standards were published by the Basel Committee in 1988. In the United States, these standards were then incorporated into federal law and phased in between 1989 and 1992.[138] Even before the ink was dry, observers were pointing out flaws in the Basel framework.[139] In particular, Basel I adopted a crude approach to risk weighting bank assets for the purposes of calculating minimum capital requirements, one that essentially divided the entire universe of financial assets into four categories—or "buckets"—based on their perceived riskiness. This presented banks with a relatively straightforward arbitrage opportunity. Specifically, by investing in the riskiest assets in any given bucket, banks could take more risks, and presumably generate more profits, while being required to hold the exact same amount of capital.

Introduced in 2004, Basel II sought to eliminate this arbitrage opportunity by permitting larger and more sophisticated banks to calculate their own risk weights under the "internal ratings-based" (or IRB) approach. In a nutshell, the IRB approach enabled banks to use their own internal computer models, historical default rates, and other market data to generate key input variables necessary to calculate minimum capital requirements for both their loan and trading books.[140] In addition to eliminating the arbitrage opportunities presented by Basel I, the introduction of the IRB approach appears to have been motivated by a desire on the part of bank regulators to ensure that capital requirements were as "accurate" as possible, i.e. that they reflected institutional and market-based assessments of credit, market, and other risks.[141]

The implementation of Basel II coincided with the outbreak of the crisis, which in turn exposed the flaws in the IRB approach. As a preliminary matter, it demonstrated that financial models based on historical data are vulnerable to small sample errors and the under-estimation of so-called "tail" risks.[142] The wide variance in risk weighting methodologies also stoked concerns that banks were using their discretion over important

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[137] Maureen O'Hara & Wayne Shaw, *Deposit Insurance and Wealth Effects: The Value of Being "Too Big to Fail"*, 45 J. FIN. 1587 (1990); *see also* Viral Acharya, Deniz Anginer & Joseph Warburton, *The End of Market Discipline? Investor Expectations of Implicit Government Guarantees* (May 2016) (unpublished manuscript), https://ssrn.com/abstract=1961656.

[138] *See* Risk-Based Capital Guidelines, 54 Fed. Reg. 4186-01 (Jan. 27, 1989); Capital Maintenance; Final Statement of Policy on Risk-Based Capital, 54 Fed. Reg. 11500-01 (March 21, 1989).

[139] *See* GOODHART, *supra* note 66, 576.

[140] The IRB approach is itself divided into two subcategories: *foundational* and *advanced* IRB. In connection with a bank's loan book, for example, the foundational approach would permit the bank to calculate a loan's probability of default (PD). Under the advanced approach, meanwhile, the bank would be permitted to calculate PD, loss given default (LGD), and exposure at default (EAD).

[141] *See* Greenwood, *supra* note 27, 36.

[142] See Ranjit Lall, *Why Basel II Failed and Why Any Basel III Us Doomed* 17 (GEG Working Paper, No. 2009/52, 2009), https://www.econstor.eu/bitstream/10419/196313/1/GEG-WP-052.pdf (describing this limitation of VaR models and citing their failure to anticipate the widespread losses related to Russia's 1998 default as another example of this model failure).

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input variables to reduce their capital requirements.[143] And most importantly, the crisis demonstrated that market-based measures of credit, market, and other risks cannot capture the *systemic* risks arising from the myriad of complex, opaque, and interconnected activities undertaken by banks and other financial institutions.[144] Banks' risk-management systems and the regulatory schemes relying on them failed, in part, because the world was complicated and dynamic in ways their models could not capture.

Predictably, the crisis was followed by yet another overhaul of the Basel framework. First published in 2010—and revised in 2011, 2012, 2014, 2016 and 2017—Basel III introduces a number of significant reforms.[145] In the realm of bank capital, these reforms include refinements to the definition and categories of capital, new countercyclical capital and capital conservation buffers, and a capital surcharge for global systemically important banks.[146] The Basel Committee has also responded to the threat that banks might manipulate the IRB approach by introducing a non-risk weighted leverage ratio and, more recently, risk weight floors for credit, market, and operational risks.[147] The target date for full implementation of Basel III was originally January 1, 2019—almost a full decade after these new standards were first published.[148] Many of the more recent reforms, including the new risk weight floors, are not scheduled for full implementation until 2027.[149]

The first thing that the thirty-year arc between Basel I and III makes clear is the pervasive and unpredictable impact of regulatory arbitrage. Despite the time, effort, and other resources committed to designing and refining the Basel framework, each iteration has been undercut by banks' efforts to limit its impact and effectiveness. Much of the evolution of the Basel framework could be cast as a process of policymakers' ongoing—and often unsuccessful—attempts to curb regulatory arbitrage. Given the time lag between the publication of new Basel standards and their implementation into domestic law, banks will likely find new ways of arbitraging Basel III long before these reforms come into full force and effect.[150] On our present course, it is therefore only a matter of time before we see another round of fundamental capital reforms. There are very good reasons to regulate bank capital, and having better capitalized banks should enhance systemic stability. Additionally, reforms like the simple leverage ratio are meant to address the dynamism and unknowns identified here to be a core challenge for financial regulation. Nonetheless, the specific processes that have been employed to try to improve capital regulation have consistently

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[143] For empirical evidence of this variance, *see* Basel Comm. on Banking Supervision, *Regulatory Consistency Assessment Programme (RCAP) - Analysis of Risk-Weighted Assets for Market Risk* (Jan. 31 2013), https://www.bis.org/publ/bcbs240.htm; Vanessa Le Leslé & Sofiya Avramova, *Revisiting Risk-Weighted Assets: Why Do RWAs Differ Across Countries and What Can Be Done About It?* (IMF Working Paper WP 12/90, 2012).

[144] See Armour et al., PRINCIPLES OF FINANCIAL REGULATION 301 (Oxford U. Press, 2016),.

[145] *See* BCBS, Basel III Global Framework, *supra* note [68]; BCBS, Finalising Post-Crisis Reforms, *supra* note [68]. For a history of the revisions to this framework, *see* Basel Comm. on Banking Supervision, *Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems – Revised Version* (June 1, 2011), https://www.bis.org/publ/bcbs189.htm.

[146] For a summary of these reforms, *see* Armour et al., *supra* note 144, ch. 13.

[147] *See* BCBS, Finalising Post-Crisis Reforms, *supra* note [68], 137–58.

[148] *See* BCBS, Basel III Global Framework, *supra* note [68], 69 annex 4.

[149] *See* BCBS, Finalising Post-Crisis Reforms, *supra* note [68], 8.

[150] *See, e.g.,* Dong Beom Choi, Michael Holcomb & Donald Morgan, *Bank Leverage Limits and Regulatory Arbitrage: New Evidence on a Recurring Question*, (Fed. Res. Bank of N.Y. Staff Report No. 856, 2018), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr856.pdf.

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generated unintended consequences, while often leaving banks undercapitalized when it matters most.

Crucially, regulatory arbitrage of the Basel framework has been an important driver of both dynamism and complexity. The development of structured finance provides an illustrative example. Among the many reasons for the rise of structured finance during the 1990s was the fact that selling mortgages and other loans into bankruptcy remote entities provided sponsoring banks with relief from capital requirements.[151] The forces of regulatory arbitrage thus contributed to the emergence and development of a complex financial ecosystem within which risks were often highly fragmented, but where—sometimes unbeknownst to regulators—contingent obligations buried deep within the documentation exposed sponsoring banks to the risk of widespread market disruption.[152] Perversely, then, the very rules designed to ensure the stability of banks thus helped spur the creation of new markets, institutions, and instruments that made it more difficult for regulators to detect the build-up of potential systemic risks within the banking system.

How policymakers have responded to the threat of regulatory arbitrage has also contributed to the complexity of banking regulation. Historically, the Basel Committee has responded to this threat by writing detailed rules designed to close the gaps exploited by banks for the purposes of reducing their capital requirements.[153] The resulting rulification is reflected in the ever increasing length of the Basel framework: while Basel I was articulated in a crisp 30 pages, Basel II ran to 347 pages, and Basel III came out at a staggering 616 pages.[154] In the United States, the legislation and regulations implementing Basel III came out at over 1,000 pages. The problem is that adopting new, more detailed, and more complex rules invites banks to find new, more bespoke, and more complex ways of getting around them.[155] It is therefore unsurprising that attempts to combat regulatory arbitrage with yet more detailed regulation have led to an exponential increase in the size and complexity of the Basel rulebook without necessarily yielding any commensurate increase in its effectiveness. As Andy Haldane and Vasileios Madouros have observed: "the regulatory response to the crisis has largely been based on the level of thinking that created it."[156] Thus, "[t]he Tower of Basel, like its near-namesake the Tower of Babel, continues to rise."[157]

The rulification of the Basel framework has also increased the probability that rules will interact in unexpected and potentially harmful ways.[158] Economists Robin Greenwood

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[151] *See* David Jones, *Emerging Problems with the Basel Capital Accord: Regulatory Capital Arbitrage and Related Issues*, 24 J. MONEY, BANKING & FIN. 35 (2000).

[152] See Armour et al., *supra* note 144, 465–66.

[153] See Greenwood, *supra* note 27, 3.

[154] For empirical data describing this rulification, along with an overview of the challenges it creates for both policymakers and market participants, *see* Andy Haldane, *The Dog and the Frisbee*, Paper Given at the Federal Reserve Bank of Kansas City's 36th Economic Policy Symposium in Jackson Hole, Wyoming (Aug. 31, 2012), https://www.bankofengland.co.uk/paper/2012/the-dog-and-the-frisbee.

[155] This observation is encapsulated in Goodhart's Law: the prediction that "any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes." *See* Charles Goodhart, *Problems of Monetary Management: The UK Experience*, *in* MONETARY THEORY AND PRACTICE 91 (1984).

[156] Haldane, *supra* note 154.

[157] *Id.*

[158] In addition to the research conducted by Robin Greenwood and others, *see* Greenwood et al., *supra* note 27, described below, the Financial Stability Board (FSB) has recently highlighted how the Basel III

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and coauthors, for example, demonstrate how the combination of market-based risk weighting methodologies (introduced under Basel II) with a non-risk weighted leverage ratio (introduced under Basel III) can incentivize banks to shift into lines of business where they are less competitive and, conversely, lead them to eschew lines of business where they possess a comparative advantage.[159] Greenwood and his coauthors see two reasons to be worried about these findings. First, the interaction between these different regulatory requirements may encourage banks to enter businesses where they have little historical expertise, existing capabilities, or risk management infrastructure.[160] Second, insofar as these requirements drive banks to adopt similar business models, this could increase the risk of correlated undercapitalization during periods of market turmoil.[161] In this way, the incremental build-up of well-intentioned rules can both engender significant changes within the financial system and potentially sow the seeds of future instability.

Lastly, the Basel framework has contributed to the cyclicality of finance. Perhaps the best example is the introduction of a risk-weighting methodology under Basel II.[162] As described above, Basel II tied the amount of capital that banks must hold to the riskiness of the assets in their portfolios. Under the IRB approach, banks could then calculate the riskiness of these assets using their own data on historical default rates and market volatility. During periods of economic expansion, the relatively low level of defaults and muted volatility would translate into lower capital requirements—enabling banks to extend more credit on the basis of the same level of capital. In this way, capital requirements would reinforce economic booms and, potentially, contribute to the formation of asset and credit bubbles. When these bubbles burst, risk weighted capital requirements would also reinforce the resulting economic contraction: forcing banks to raise more capital during periods of relatively high volatility, reduce lending, or sell portfolio assets to shore up their balance sheets.

Many of these same challenges can also be observed in connection with new liquidity rules introduced under Basel III. Many view the acute liquidity problems that banks and other financial institutions experienced as the root of the crisis. In response, the Basel Committee introduced two new liquidity rules: the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR).[163] The LCR is designed to ensure that banks have a sufficient stock of high-quality liquid assets to survive a hypothetical 30-day stress scenario. The

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leverage ratio interacts with the new margin requirements for derivatives to disincentivize access to central clearing, thus undermining one of the key pillars of the post-Crisis reform agenda. *See* Fin. Stability Bd., Bank for Int'l Settlements, & Int'l Org. of Secs. Comm'ns, *Incentives to Centrally Clear Over the Counter (OTC) Derivatives: A Post-Implementation Evaluation of the Effects of the G20 Regulatory Reforms* – Final Report 62–68 (Nov. 19, 2018) [hereinafter FSB, Incentives to Centrally Clear OTC Derivatives], http://www.fsb.org/2018/11/incentives-to-centrally-clear-over-the-counter-otc-derivatives-2/; *see also* Richard Haynes, Lihong MacPhail & Haoxiang Zhou, *When Leverage Ratio Meets Derivatives: Running Out of Options?* (Oct. 29, 2018) (working paper on file with authors).

[159] Greenwood et al., *supra* note 27, 18.

[160] *Id.*, 27.

[161] *Id.*

[162] Anil Kashyap & Jeremy Stein, *Cyclical Implications of the Basel II Capital Standards*, FED. RES. BANK OF CHI. ECON. PERSPECTIVES 18 (2004).

[163] *See* Basel Comm. on Banking Supervision, *Basel III: The Liquidity Coverage Ratio and Liquidity Risk Monitoring Tools* (Jan. 2013), https://www.bis.org/publ/bcbs238.pdf; Basel Comm. on Banking Supervision, *Basel III: The Net Stable Funding Ratio*, (Oct. 2014), https://www.bis.org/bcbs/publ/d295.htm.

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NSFR, meanwhile, is designed to constrain the reliance of banks on unstable, short-term sources of wholesale funding.

While the rationale for both the LCR and NSFR may seem relatively straightforward, their design and implementation have proven far more challenging. The OFR, for example, has suggested that the complexity of the LCR, at least as adopted in the United States, serves to undermine its utility as a benchmark for evaluating a bank's liquidity position.[164] There is also some evidence, and a lot of concern, that the LCR may be reducing the amount of liquidity creation and transformation being performed by banks and other financial institutions.[165] And as noted above, the LCR is among the forces interacting with recent money market mutual fund reforms to spur the growth of the FHLBank system.[166] It is also changing what types of banks are borrowing from FHLBanks, leading to more borrowing by the largest banks, and thus potentially engendering competition among them.[167] Meanwhile, full implementation has been delayed in part on concerns about potential unintended consequences, along with its potential impact on bank profitability.[168] Despite the best of intentions, it is thus still far from clear whether the new Basel liquidity rules will ultimately have the desired impact.

Just how little we know about the potential impact of the new Basel liquidity rules is evident from the debate surrounding the causes of recent instability in the U.S. repo market. For several days in September 2019, interest rates within short-term repo markets experienced a short, sharp spike—from roughly 2 percent to a high of 10 percent.[169] This spike coincided with both the corporate tax year end and a significant new issuance of U.S. government debt, but those events were known and foreseeable, and thus should have been able to be managed by the Fed. Another story is that banks are subject to so many ratios now that they are not themselves able to accurately predict which will be binding at any given time. This may have made them more hesitant to engage in the arbitrage that should have eliminated that spike, particularly if they were worried about complying with their liquidity requirements under the new LCR.[170] Yet others blame the Fed's policy of paying

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[164] Jill Cetina & Katherine Gleason, *The Difficult Business of Measuring Banks' Liquidity: Understanding the Liquidity Coverage Ratio* (Office of Fin. Research Working Paper 15-20, 2015), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2681372.

[165] Petro Gete & Michael Reher, *Mortgage Securitization and Shadow Bank Lending* (July 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2921691; Marco Macchiavelli & Luke Pettit, *Liquidity Regulation and Financial Intermediaries* (April 17, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3179800; Daniel Roberts et al., *Bank Liquidity Provision and Basel Liquidity Regulations* (Fed. Reserve Bank of N.Y. Staff Report No. 852, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3199876.

[166] *See* Part III(a).

[167] Stevan Gissler & Borghan Narajabad, *The Increased Role of the Federal Home Loan Bank System in Funding Markets, Part 2: Recent Trends and Potential Drivers*, FEDS Notes, Oct. 18, 2017, https://doi.org/10.17016/2380-7172.2093

[168] Michael King, *The Basel III Net Stable Funding Ratio and Bank Net Interest Margins,* 37 J. BANKING & FIN. *4144* (2013).

[169] *See* Joe Rennison & Laura Noonan, *Week of Repo Turmoil Puts Wall Street Traders in a Spin*, FINANCIAL TIMES (Sept. 20, 2019).

[170] *See* for example Erik Sherman, *The Fed's Repo Market Bailout is a Sign of Bigger Problems*, FORTUNE (Sept. 26, 2019).

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banks interest on excess reserve as part of how they do monetary policy.[171] Not surprisingly, this instability ended with the Fed injecting over $100 billion into the market. We don't have any deep insight into the actual explanation, but the Fed's inability to predict and avoid a spike of this magnitude and the degree of contestation over the reasons for it are themselves indications of just how complex and costly the current regime is, both in terms of outcomes and accountability.

The dynamism and complexity of modern finance, together with the poorly understood feedback effects between capital requirements and bank behavior, generate significant unknowns. Indeed, for all the technocratic expertise that has gone into the design of the Basel framework—including several attempts to empirically quantify its costs and benefits—there is still remarkably little consensus around many seemingly basic questions. Perhaps most importantly, while something of a consensus has started to emerge around the need for stringent capital requirements, there is considerably less agreement around the precise benefits and costs of imposing higher capital requirements on banks and other large financial institutions, the tradeoffs of having multiple different constraints, and the value of having liquidity constraints alongside the capital requirements.[172]

The ongoing evolution of the Basel capital requirements demonstrates, yet again, just how much faster finance moves relative to financial regulation. More importantly, it demonstrates how conventional approaches to financial regulation are poorly equipped to address the challenges stemming from the dynamism, complexity and unknowns of the financial system. Although capital can help protect against unknowns and uncertainty, and is clearly important, layered capital requirements can exacerbate those very dynamics. Examining the history of capital requirements, how they have evolved and how banks have responded to them, reveals significant failings in the processes through which these requirements are promulgated, enforced, and revised.

c. Broadening the lens

Taking a step back from our two case studies reveals that this mismatch between finance and financial regulation is not an isolated phenomenon. In fact, we could have just as easily picked any number of post-crisis reforms. While the details inevitably vary, these reforms have almost universally generated effects—some positive, others less so—that were not foreseen, despite the breadth and depth of the policy process leading up to their adoption. Take for example mandatory central clearing of derivatives. To facilitate netting and promote transparency, the United States and other countries now require standardized derivatives to be cleared through centralized clearinghouses. However, while mandatory clearing may have yielded many of the expected gains, it has also increased the size and systemic importance of clearinghouses, thus effectively creating new nodes of systemic risk.[173] It has also contributed to the massive growth and concentration of the largest

[171] This appears to be the view adopted by the Fed itself, which responded to the recent instability by reducing the amount of interest it pays on excess reserves; *see* Jeff Cox, *Fed Cuts Rate on Bank Reserves Amid Repo Market Turmoil*, CNBC (Sept. 18, 2019).

[172] For a survey of different views on this question, *see* Eric Posner, *How Do Bank Regulators Determine Capital Adequacy Requirements?* 9–11 (Coase-Sandor Institute for Law & Econ. Working Paper No. 69, 2014).

[173] *See* FSB, Incentives to Centrally Clear OTC Derivatives, *supra* note 158.

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clearinghouses[174] and reduced market discipline among clearing members, who now have less direct exposure to the default of other clearing members. These and other developments raise real questions about regulators' role and authority should something go wrong.[175]

Another example is the controversial Volcker Rule, a provision of the Dodd-Frank Act that prohibits banks from engaging in proprietary trading. From the outset, many questioned whether activities that were not obviously tied to the causes of the crisis should be targeted for reform.[176] The rule took years to finalize, is massively complex, and imposes significant compliance costs on banks. Indeed, Volcker himself has lamented its complexity.[177] Viewed by its sponsors as a modern-day version of the (initially far simpler) separation of commercial and investment banking under the Glass-Steagall Act, by the time of its adoption the rule had morphed into something nobody in Congress had envisioned.[178] There have also been fears, and mixed evidence, that the rule may be adversely affecting liquidity in the bond market.[179] At the same time, others now see benefits of the rule that they did not anticipate in advance. For example, the capacity of the rule to change who wants to work at a bank and to alter the overall risk-taking culture of banks may be greater than initially appreciated.[180] Just as we saw in the case of capital requirements, it often takes time to understand why a rule is working even when it yields real benefits. Even then, the longer term consequences of reform remain difficult to assess.

Going back to the original Glass-Steagall separation between commercial and investment banks reveals a similar learning curve. According to Senator Glass, one of the original rationales for the separation stemmed from the conflicts of interests arising from allowing commercial banks to underwrite corporate securities. Only much later did empirical investigation of the quality of the securities issued by universal banks before Glass-Steagall was adopted cast doubt on this rationale—helping fuel the case for its repeal.[181]

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[174] Amir Khwaja, *Swaps Data: The Monopoly Effect in Clearing*, RISK.NET (Feb. 15, 2018), https://www.risk.net/comment/5416976/swaps-data-the-monopoly-effect-in-clearing (providing a detailed breakdown of market share for an array of products in the swaps markets and showing massive concentration for many products).

[175] OFR Fin. Research Advisory Comm., *CCP Resolution Working Group. Managing the Recovery and Resolution of a Central Counterparty* (Feb. 28, 2019), https://www.financialresearch.gov/frac/files/OFR_FRAC-meeting_working-group_ccp_02-28-2019.pdf.

[176] *See, e.g.,* Douglas Elliott, *The Volcker Rule Is Still a Bad Idea*, BROOKINGS INST. (Mar. 19, 2012), https://www.brookings.edu/opinions/the-volcker-rule-is-still-a-bad-idea/.

[177] Rachel Armstrong, *Paul Volcker says Volcker Rule Too Complicated*, Reuters, Nov. 9, 2011, https://www.reuters.com/article/us-regulation-volcker/paul-volcker-says-volcker-rule-too-complicated-idUSTRE7A83KN20111109 (quoting Paul Volcker as saying that the Volcker Rule is "much more complicated than I would like to see").

[178] *See* Senator Jeff Merkley & Senator Carl Levin, *The Dodd-Frank Act Restrictions on Proprietary Trading and Conflicts of Interest: New Tools to Address Evolving Threats*, 48 HARV. J. ON LEGIS. 515, 538–39 (explaining the origins and evolution of the Volcker Rule and why it is intended to be a modern-day version of Glass-Steagall) (2011).

[179] Jack Bao, Maureen O'Hara, & Alex Zhou, *The Volcker Rule and Market-Making in Times of Stress* (Fed. Res. Bd. Working Paper No. 2016-102, 2016), https://www.federalreserve.gov/econresdata/feds/2016/files/2016102pap.pdf.

[180] John Coates IV, *The Volcker Rule as Structural Law: Implications for Cost-Benefit Analysis and Administrative Law*, 10 CAPITAL MKTS. L.J. 447, 453–58 (2015).

[181] Randall Kroszner & Raghuram Rajan, *Is the Glass-Steagall Act Justified? A Study of the U.S. Experience with Universal Banking Before 1933*, 84 AM. ECON. REV. 810 (1994).

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After the recent crisis, however, academics began looking for better explanations of why the U.S. financial system had been so stable for the fifty years following the Great Depression. This re-examination produced an array of credible, alternative rationales for why Glass-Steagall may have been very helpful in promoting financial stability. Professor Adam Levitin, for example, has suggested that the "unintended genius of Glass-Steagall" was that splitting up commercial banks, investment banks, and insurance companies broke up the political power of the financial services industry.[182] Glass-Steagall, in other words, created sophisticated, informed, and well-funded industry participants on *both* sides of many regulatory debates, creating a more balanced and productive setup for future lawmaking. Economist Joseph Stiglitz later argued that "[t]he most important consequence of the repeal of Glass–Steagall was … the way repeal changed an entire culture." In his assessment, the unappreciated benefit of Glass-Steagall was that it made commercial banks more boring—and thereby more stable—by making them unattractive places for risk-seeking financiers. Professor Arthur Wilmarth, who has advocated for the return to Glass-Steagall, has similarly suggested that the competitive pressures that push financiers toward greater risk-taking are exacerbated by the universal banking model.[183]

The aim here is not to seek answers to these difficult questions or to weigh in on any particular policy issue. Rather, these examples highlight the existence of meaningful gaps between the discourse around these rules when they were first adopted and the effect of these rules once in place. Time and again, the processes designed to encourage informed debate, enhance the quality of adopted rules, and promote buy-in from stakeholders have failed to reveal what later proved to be among the most critical issues. This is important not only because it means excessive resources are being invested ex ante, or that potentially counterproductive frictions are imposed on changing existing rules, but because it means there is in practice often no process that allows meaningful discussion of the *actual* issues at stake. Hence those laudatory aims, from efficacy to legitimacy, too often go unfulfilled.

IV. Some Progress

We are far from the first to observe that dynamism, complexity, and unknowns are core features of modern financial systems. Nor are we the first to raise concerns about the myriad challenges they create for financial regulation. This part briefly surveys some of the post-crisis reforms and other efforts underway to address these dynamics. It then considers some of the proposals and models already on the table for addressing these challenges. The focus here is on why our central claim—that the mismatch between finance and financial regulation helps to explain why financial regulation so often has failed in the past and will likely fail again in the years ahead—remains pressing despite these developments. On both fronts, we engage with a thin but hopefully representative slice of the relevant activity and ideas. This analysis suggests that despite some progress, both analytically and on the ground, the core mismatch remains and the challenges it imposes are as great, if not greater, than ever.

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[182] Adam Levitin, *The Politics of Financial Regulation and the Regulation of Financial Politics: A Review Essay*, 127 HARV. L. REV. 1991, 2060–61 (2014).

[183] Arthur Wilmarth, Jr., *The Road to Repeal of the Glass-Steagall Act*, 17 WAKE FOREST J. BUS. & INTELL. PROP. L. 441, 444 (2017).

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a. Reforms Underway

i. Harnessing New Technology and Data Standardization

One way to tackle the challenges posed by dynamism, complexity, and unknowns is for policymakers to take better advantage of technological advancements in the realm of data collection and analysis. These approaches have the potential to reduce the effective unknowns and make complexity and dynamism more manageable by enhancing the ability of market participants and regulators to monitor developments and the systemic implications of changes in a more timely and comprehensive fashion. Closer examination of the post-crisis efforts to develop and ensure widespread use of well-designed data standards supports this promise, but also brings to the fore the pragmatic challenges and current limits of using technology to tackle these challenges.

The good news is that in the wake of the crisis, there have been a number of initiatives designed to leverage new technologies to collect and analyze data and to standardize data to make it more usable. A prominent example is the legal entity identifier (LEI) initiative. An LEI is a 20-character, alpha-numeric code that connects to key reference information about legal entities participating in financial transactions. Each LEI contains information about an entity's ownership structure and thus answers the questions of "who is who" and "who owns whom." Over a longer time horizon, this information could be integrated with unique product identifiers (UPIs) linked to key reference information about individual financial products—from basic equity and debt to derivatives and other more exotic instruments—thus answering the question of "who owns what." LEIs and UPIs would then work in tandem: with the former capturing information about the counterparties to each transaction, and the latter the salient details of the transactions themselves.[184]

In theory, these types of developments, particularly if used in conjunction with other new technologies, hold out a number of potentially significant benefits. More granular and standardized data can help regulators aggregate, manipulate, and compare firm-level data with the objective of identifying potential microprudential risks. This data can also be aggregated to help regulators identify and monitor risks across sectors and over time, a critical first step to more effective macroprudential oversight. More effective use of new technologies, along with more comprehensive data standardization, would thus give regulators more lead time to design effective, efficient, and appropriately tailored ways of addressing these risks and could prove particularly useful in crisis management. Together, technology and data standards can thus be viewed as the building blocks of a more accurate and complete map of the myriad of complex and dynamic interactions within the financial system.

Shifting from theory to practice, however, reveals a different state of affairs. There has been some progress in data standardization and related efforts to cut through the complexity of the financial system, but this progress has been "slow, hard won, and, in many areas, illusive."[185] Even low-cost improvements, like full adoption of the LEI, have yet to be achieved in the United States despite having been mandated throughout Europe. If

[184] *See* Armour et al., *supra* note 144, ch. 28.

[185] Richard Berner & Kathryn Judge, *The Data Standardization Challenge* 4 (Columbia Law & Econ. Working Paper No. 598, 2019).

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anything, the low priority given to the basic building blocks necessary to realize the promise of new technologies, such as data standardization, reveals just how far from ideal the current regulatory process remains.[186] More generally, although the fintech and regtech movements, and their building blocks like standardization, are likely to be critical to addressing complexity, dynamism, and unknowns, doing so will require a very different framework for congressional and public involvement. Looking at the potential here provides more, not less, reason for concern about the current processes undergirding financial regulation.

ii. Stress Testing

One of the most important crisis-era regulatory innovations has been the introduction of "stress testing" for the largest banking organizations. Stress testing involves the use of hypothetical scenarios envisioning significant economic and financial shocks in order to assess how banks would fare under those conditions and, at times, to assess the robustness of the internal systems that banks use to monitor and constrain their own risk-taking. The first large-scale supervisory stress tests were conducted by the Federal Reserve in 2009 and proved critical to restoring the faith of market participants in the health of the largest bank holding companies. Today, stress testing involves two separate but complementary processes: the Dodd–Frank mandated stress tests (DFAST) and the Comprehensive Capital Analysis and Review (CCAR). Where these tests reveal significant weaknesses, banks may be prohibited from making distributions to shareholders, thereby increasing their capital.

The institutionalization of stress testing suggests a growing appreciation of dynamism and unknowns, and the need for new tools to address these challenges. Stress tests are forward-looking exercises that, when well executed, can illuminate weaknesses in risk management systems, latent capital deficiencies, and other dynamics not readily identified under more traditional approaches to capital regulation or supervision. In many ways, they mark an important step forward. By making capital requirements more responsive to the unique risks to which a bank is exposed, and how they may play out when things go wrong, these exercises introduce helpful dynamism into the prudential regulatory regime. They can also help mitigate gamesmanship of capital adequacy requirements.[187]

The growing gap between finance and financial regulation helps explain why stress testing is such a welcome new development and provides further support for its continued and expanded use.[188] However, a closer examination of stress testing reveals another gap: this one between theory and practice. As a preliminary matter, the DFAST and CCAR stress tests only apply to a relatively narrow subset of financial institutions (i.e. conventional deposit-taking banks). Moreover, much like data standardization, the potential to use this tool to address the challenges posed by dynamism, complexity and unknowns depends a great deal on the mindset and assumptions of the regulators involved.[189] In this respect,

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[186] *Id.*

[187] *See generally* HANDBOOK OF FINANCIAL STRESS TESTING (J. Doyne Farmer, Alissa Kleinnijenhuis, Til Schuermann, & Thom Wetzer eds., Cambridge University Press forthcoming 2020).

[188] *Id.*

[189] Paul Krugman, *The 2008 Financial Crisis as Seen From the Top*, N.Y. TIMES (April 16, 2019), https://www.nytimes.com/2019/04/16/books/review/ben-bernanke-timothy-geithner-henry-paulson-firefighting.html.

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recent statements by Fed officials are not encouraging. When announcing the results of the 2017 tests, for example, Fed Chair Jerome Powell stated: "This year's results show that, even during a severe recession, our large banks would remain well capitalized…. This would allow them to lend throughout the economic cycle, and support households and businesses when times are tough."[190] In response to the 2019 tests, this view was echoed by Randal Quarles, the vice-chairman of the Fed in charge of banking supervision: "The results confirm that our financial system remains resilient . . . . The nation's largest banks … would be well-positioned to support the economy even after a severe shock."[191]

Other leading figures have questioned these conclusions. Former Treasury Secretary Lawrence Summers, for example, recently observed "that recent stress tests estimate that if GDP drops 6.25 percent, unemployment doubles, the stock market halves, and real estate falls by 25 to 30 percent, then capital losses would be insufficient to trigger [regulatory intervention]". He went on to say that these conclusions are "more of a comment on the inadequacies of the stress test procedures, than on the soundness of the banks."[192] Summers' comments reflect an acknowledgement of the fact that the stress tests rely heavily on models and assumptions that inevitably fail to capture the full range of dynamics that will be at play in the thick of the next recession or financial crisis.

We can frame the significance of these two competing views by considering, briefly, the role of "humility" in making accurate forecasts—including stress tests. Philip Tetlock, one of the leading scholars on forecasting, has demonstrated that experts are often exceptionally bad forecasters. His work on forecasting provides an array of relevant insights into the mindsets that enable more accurate forecasting. One of the most important is humility. Humility, in Tetlock's telling, is not false modesty or a lack of confidence as commonly conceived. Rather, it means understanding of what one knows and what one does not. In his co-authored book, *Super Forecasting: The Art and Science of Prediction*, he explains: "The humility required for good judgment is not self-doubt…. It is *intellectual* humility. It is a recognition that reality is profoundly complex, that seeing things clearly is a constant struggle, when it can be done at all, and that human judgment must therefore be riddled with mistakes."[193]

In theory, stress testing could well foster this type of humility. One of the important features of the current stress testing process is that banks run their own independent tests alongside those conducted by the Fed itself. Disparities in the results of these could serve as a reminder of the inherent limitations of any risk management framework. This is just the type of thinking that the analysis here suggests is critical. But the statements by Powell and Quarles suggest a very different mindset, one that views the results as confirmations of how good things are and how much they know—precisely the type of thinking that contributed to

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[190] Press Release, Bd. of Governors of the Fed. Reserve Sys., *Federal Reserve Board Releases Results of Supervisory Bank Stress Tests* (June 22, 2017), https://www.federalreserve.gov/newsevents/pressreleases/bcreg20170622a.htm.

[191] John Heltman, *Banks Sail Through Year's First Round of Stress Tests*, AM. BANKER (June 21, 2019), https://www.americanbanker.com/news/banks-sail-through-years-first-round-of-stress-tests.

[192] Lawrence H. Summers, *Larry Summers: 5 Suggestions for Avoiding Another Banking Collapse*, WASH. POST (May 22, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/05/22/larry-summers-5-suggestions-for-avoiding-another-banking-collapse/?noredirect=on&utm_term=.08135b761dec (crediting his colleague Jeremy Bulow with first making this point).

[193] Tetlock & Gardner, *supra* note 62, 228.

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the failure of regulators to foresee the cracks ahead of the last crisis.[194] Stress tests are an important new tool in helping to mitigate the challenges this paper places front and center, but untethered from an appreciation of those challenges, they could do as much harm as good in preventing the next crisis.

iii. Macroprudential policies

Another post-crisis shift that would seem even more responsive, in theory, to the challenges revealed here is the rise of a "macroprudential" tool for financial regulation. As then-Chairman of the Fed Ben Bernanke explained in 2011: "The systemic orientation of the macroprudential approach may be contrasted with that of the traditional, or 'microprudential,' approach to regulation and supervision, which is concerned primarily with the safety and soundness of individual institutions, markets, or infrastructures."[195] Macroprudential oversight was meant to address systemic risk that could not be detected, and may be accentuated, by an excessive focus on the constitutive components of the financial system apart from the broader ecosystem in which they operate. Yet, U.S. policymakers, unlike their counterparts abroad, have been given few of the tools needed to implement macroprudential policies.[196] Moreover, the notion of macroprudential oversight has evolved, in many circles, from encouraging critical and creative thinking about the workings of the financial system as a whole to focusing on a narrower set of specific policies, often reducing borrower leverage.[197] And, these policies themselves are now being recognized as potential triggers of behavioral changes that have effects elsewhere in the financial system.[198] Thus, in a manner akin to the rise of stress testing, the rise of a macroprudential approach reflects an implicit understanding that the complexity, dynamism and unknowns that characterize finance undermine traditional approaches to financial regulation. Yet, divorced from a recognition of the need for more fundamental changes to how financial regulatory policy is made and revised, and a recognition of the core mismatch illuminated here, macroprudential policies are unlikely to achieve the ambitious aims originally envisioned for them.

b. Proposals for Further Reform

Just as we are not the first scholars to acknowledge the dynamism, complexity, and unknowns of modern finance, we are far from the first to raise concerns about the processes through which law is made. Lawmaking has always been about compromise and tradeoffs,

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[194] *See* Clarida, *supra* note 60.

[195] Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Implementing a Macroprudential Approach to Supervision and Regulation (May 5, 2011), https://www.federalreserve.gov/newsevents/speech/bernanke20110505a.htm.

[196] John C. Williams, *Macroprudential Policy in a Microprudential World*, FED. RESERVE BANK OF S.F. (June 1, 2015), https://www.frbsf.org/economic-research/publications/economic-letter/2015/june/macroprudential-policy-in-a-microprudential-world/.

[197] Stijn Claessens, *An Overview of Macroprudential Policy Tools* 36 tbl. 1 (IMF Working Paper No. WP/14/214, 2014), https://www.imf.org/external/pubs/ft/wp/2014/wp14214.pdf (providing a taxonomy of specific policies that are now deemed macroprudential).

[198] *Id.*; Sharon Kahn & Patricia C. Mosser, Columbia Sch. of Int'l & Pub. Affairs, Conference Summary: Can Macroprudential Policy Make Global Finance Safer? (Nov. 12, 2015), https://sipa.columbia.edu/sites/default/files/Can-Macroprudential-Policy-Make-Global-Finance-Safer.pdf.

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making the process almost too easy a target. There are also numerous trans-substantive debates that bear on the questions here at stake. Nick Bagley, for example, has raised fundamental questions about whether there may be "too much" procedure in administrative law,[199] a claim that aligns with the concerns we raise. Because of space constraints, we make little effort to cover the range of relevant ideas and proposals and focus instead on just a couple of the proposals that most clearly target the concerns we raise here. The first focuses on financial regulation in particular, and the second on a range of proposals for dealing with unknowns and related challenges in trans-substantive ways.

i. Automatic Sunset Clauses

As described in Part II, financial regulation often has the appearance of a single-shot game, with policymakers identifying a perceived market failure, going through some process of engagement and deliberation, and then designing and implementing a rule aimed at eliminating this failure. This is especially the case at the domestic level, where significant regulatory reforms are often only implemented in response to financial scandals or crises. The problem, of course, is that the dynamism of finance means that regulation adopted at any particular moment in time may not be optimal at any future point. Moreover, complexity and unknowns—together with our own prior and competing objectives—may mean that regulation fails to advance desired objectives right from the start. This is especially the case for crisis-driven regulation: where our incomplete understanding of the problem, together with the political, economic, and other exigencies of the crisis, often mean that regulation misses the intended target.[200]

Professor Roberta Romano has written extensively about these challenges and, on some level, many of her concerns mirror our own. Paramount among her concerns is that too much financial regulation is passed in the immediate wake of crises, resulting in rules that are not adequately informed and otherwise tainted by the politics of scandal and crisis. She has argued that imposing mandatory "sunset" clauses on these rules could improve the quality of financial regulation. These clauses would result in new rules automatically expiring unless re-affirmed, thus potentially compelling lawmakers to incorporate new learning about the causes of a crisis and the consequences, intended and otherwise, of the reforms.[201]

Yet taking complexity, dynamism, and unknowns seriously suggests that sunsets may well be a mixed bag, with even more potential to do harm than the stress tests. While turning a single-shot game into a two-shot game may help incorporate new learning and facilitate critical re-assessment, it does little to respond to the nature or pace of change within the financial system over the longer run. Nor does it address the challenges created when the unintended consequences of a new regulation—in banking, for example—are experienced in other domains—like insurance or securities. Indeed, given the propensity for

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[199] *See* Bagley, *supra* note 89.

[200] *See* Coffee, *supra* note [18]; Roberta Romano, *Regulating in the Dark*, (Yale Law & Econ. Research Paper No. 442, 2012) [hereinafter, Romano, *Regulating in the Dark*].

[201] Romano, *Regulating in the Dark*, *supra* note 200, 2; Romano, *Sarbanes-Oxley, supra* note 16, 1600–01 (arguing that sunsets would "mitigate the problem of quasi-permanent regulatory blunders produced by emergency legislation that burdens financial markets, thereby impeding capital development and growth, without any discernible compensating benefit").

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logrolling within the vetogate model, automatic sunset clauses may introduce their own adverse and unintended consequences. And, of course, while unknowns may be particularly problematic for crisis-driven regulation, they are also highly problematic for financial regulation adopted under less volatile political and economic conditions. Ultimately, however, our biggest concern is the net effect on regulation. A default rule that envisions less regulation cannot assure smarter regulation. This is not to rule out sunset clauses as a tool that may, at times, be warranted—but it does suggest that these clauses are not a sufficient response to the core challenges posed by dynamism, complexity, and pervasive unknowns.

ii. Experimentalism and Experimentation

The challenges we identify as core to finance also arise, albeit in different degrees, in an array of other domains. Accordingly, there have been a number of efforts and proposals to try to address the uncertainty that so often plagues attempts to produce effective regulations and enable informed discussion. Some of these efforts have focused on experimentation, seeking to find ways to conduct rigorous experiments with the aim of generating the missing information prior to finalizing a new regulation or seeking to facilitate quasi-experimentation by, for example, allowing states to implement different rules.[202] Among the benefits of such an approach, when feasible, is that it can help mitigate the challenge of excess process before rules are adopted—when information is lacking—and enable more analysis at a later point in time, such as after a rule has been implemented on a small scale.[203] There is much in this literature that might, in time, be useful in operationalizing a better way to address the challenges in finance that we identify as core. Going even further, and recognizing *all* regulation as experimentation, is the type of shift in mindset consistent with what we advocate for here.

So far, however, this is not the approach advocates have tended to embrace. They remain more focused on measurable costs and benefits than the longer-term structural changes that we see as fundamental. This likely reflects the challenge of using this type of methodology to assess the impact on an outcome like the resilience of the financial system as a whole. Even in domains where it has more obvious benefits, however, efforts to utilize formal experimentation in rulemaking, although progressing, remain marginal and have had only mixed success.[204]

Another approach that is working quite successfully in a number of domains is "experimentalism." Charles Sabel and William Simon have shown that experimentalism is being used in industrial and regulatory settings to address the challenge of unknowns and

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[202] *See* Michal Greenstone, *Toward a Culture of Persistent Regulatory Experimentation in* NEW PERSPECTIVES ON REGULATION (David Moss & John Cisternino, eds., 2009); Colleen Chien, *Rigorous Policy Pilots: Experimentation in the Administration of the Law*, 104 IOWA L. REV. 2313 (2019).

[203] Greenstone, supra note 202, 113–14.

[204] *See* Michael A. Livermore, *The Perils of Experimentation*, 126 YALE L. J. 564 (2017) (using two examples of prominent rulemakings in the environmental space to assess the upsides and downsides of policy experimentation); *see also* David Super, *Laboratories of Destitution: Democratic Experimentalism and the Failure of Antipoverty Law*, 157 U. PA. L. REV. 541, 546–48 (2008) (examining the inefficacy of local experimentation to generate sound policies to address poverty).

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could be used further.[205] The experimentalist framework is based on a hub-and-spoke structure that combines discretion and reporting by those on the front lines with ongoing revision of the rules by those at the center in light of new information. This type of iterative process can yield real gains in environments where detailed specification is difficult ex ante, and where there is some centralized mechanism that can collect, analyze, and revise rules in light of the insights only experience can yield.[206]

There is a clear overlap between the concerns we raise and those underlying experimentalism. The notion of governance mechanisms designed to "compensate for the absence of ex ante knowledge" and promote "rapid, deliberate learning from parallel and collaborative exploration of new risks and possibilities" would seem to go a long way to address the challenges posed by the dynamism, complexity, and unknowns of modern finance.[207] Moreover, by grounding their initial work in a critique of excessive efforts toward optimizing a static regime and embracing an understanding of "[r]reliability [that] entails responsiveness, not just to strong signals like prices, but to weak signals, such as small anomalies or deviances,"[208] their work reorients the discussion of regulation in ways that are critical if we are to address the challenges we see as core.

Given the importance and relevance of their work, it is all the more striking that models akin to experimentalism have been deployed only on a limited basis and with decidedly mixed results in the realm of finance. Consider, for example, the discretion that the IRB approach under Basel II gave to the largest banks to use their own risk management systems to calculate their regulatory capital requirements. The aim of this approach, like experimentalism, was to overcome the static, coarse, and backward-looking nature of standardized capital requirements.[209] This approach also resembles the experimentalist frame in that it enabled national regulators to harness and learn from the sophisticated risk management systems banks instituted and to update their assessments across firms accordingly, creating a system that theoretically could respond to challenges that neither banks nor regulators could identify and specify ex ante. The IRB approach, which also grew out of the premise that both banks and their regulators wanted to minimize the possibility of bank failure, hence tried to harness an area of common interest. The results, however, were disastrous. Although not fully implemented when the crisis hit, many view the IRB approach

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[205] *See* Charles Sabel & William Simon, *Minimalism and Experimentalism in the Administrative State*, 100 GEO. L.J. 53 (2011); *see also* Lisa Larrimore Ouellette, *Patent Experimentalism*, 101 Va. L. Rev. 65 (2015); Charles Sabel & Jonathan Zeitlin, *Learning from the Difference: The New Architecture of Experimentalist Governance in the EU*, 14 EUR. L.J. 271 (2008).

[206] Experimentalism shares a number of parallels with the work of regulatory scholars such as Robert Baldwin and Julia Black. *see, e.g.*, Robert Baldwin & Julia Black, *Really Responsive Regulation* 71 MOD. L. REV. 59 (2008); Julia Black, *Decentring Regulation: Understanding the Role of Regulation and Self-Regulation in a 'Post-Regulatory' World*, 54 CURRENT LEGAL PROB. 103 (2001).

[207] Handbook of Financial Stress Testing, *supra* note 187, 2.

[208] Sabel & Simon, *supra* note **Error! Bookmark not defined.**, 61.

[209] There are some meaningful differences in the details between how Basel II's IRB approach worked and the functioning of the experimentalism model. Nevertheless, there was significant overlap in the spirit and design of both models. Both aimed to enable more learning and better rules through a more decentralized structure, in part to overcome difficulties of ex ante specification.

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as a significant contributor to its depth.[210] The large investment and commercial banks that were using this approach were among those who fared the worst when conditions soured, and lawmakers have substantially scaled back on the use of IRB in response. The notion that shared incentives can justify passing discretion along to those closer to the problem—whether from international rulemaking bodies like Basel to nation states or from regulators to banks—is among the casualties of the crisis. Whether it will be revived remains to be seen.

A related challenge is that for regimes like experimentalism to succeed, the signals going from spoke to hub must—even if noisy—be probative of the outcomes that regulation is seeking to achieve. This feedback is what allows for refinement over time. Yet financial markets often don't work this way. Among the reasons that the IRB approach failed so spectacularly is that many of the indicators that banks and their regulators were focused on suggested that banks and the broader financial system were healthy when, we know now, they were very far from it. Just as Minsky and others predicted, periods of stability change behavior and the pricing of financial assets in ways that ultimately made the financial system more vulnerable.[211] The feedback, in other words, provided false signals that were contrary to the outcome that mattered most. This is part of what dooms efforts at formal experimentation, and also part of what makes experimentalism difficult.

The experimentalist framework marks an important step forward relative to the more traditional approaches that still dominate. At this stage, however, this close examination of why this model—which works so well to address related challenges in other domains—is not being used widely and cannot readily be deployed to improve financial regulation serves primarily to highlight the nature and magnitude of the challenge.

V. A More Holistic Approach to Financial Regulation

This Part complements our central claim that the mismatch between the nature of finance and the processes through which finance is regulated sets financial regulation up to fail by considering, in broad terms, how this challenge might be mitigated. Our call is for a more holistic approach to financial regulation. The aim here is both to provide a glimmer of hope and to further illuminate the nature and magnitude of the challenge we now face by showing what would be needed for regulation to better accommodate the realities of modern finance.

Merriam-Webster dictionary defines "holistic" as "relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts."[212] The term holism was coined by South African Jan Smuts in 1926 as part of an effort to illuminate the fundamental limitations in western approaches to knowledge in domains like science. As he explained: "Analysis, abstraction and generalisation are indeed necessary as instruments of scientific understanding, but they also necessarily involve a

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[210] Ranjit Lall, *Why Basel II failed and why any Basel III is doomed* 21 (GEG Working Paper, No. 2009/52, 2009), https://www.econstor.eu/bitstream/10419/196313/1/GEG-WP-052.pdf (arguing that "[f]ar from helping to avert the crisis, the [Basel II] accord in fact directly contributed to it," and identifying the way the IRB approach officially sanctioned flawed VaR models as a central factor behind that contribution).

[211] *See supra* Part II.A.

[212] *Holisitc*, MERRIAM WEBSTER'S COLLEGIATE DICTIONARY (11th ed. 2009), https://www.merriam-webster.com/dictionary/holistic.

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departure from the complex concrete."[213] The effort to bring rigor requires breaking down a complex ecosystem into more knowable parts. This has some real benefits but also profound limitations.

Shifting from abstractions to practice, we see multiple mechanisms through which a holistic approach to finance could improve regulatory processes and outcomes. One avenue is through changing the analytical frame through which policy makers and others assess the landscape and options before them. As we have seen, conventional approaches typically begin with the categorization of different species of markets and institutions. The Fed, OCC, and FDIC regulate "banks," the SEC regulates "securities" and "investment funds," and state insurance regulators regulate "insurance" firms. Reflecting this deeply engrained path dependence, these regulatory authorities are then charged with advancing specific objectives such as the safety and soundness of individual institutions, the informational efficiency of securities markets, and the protection of the consumers from unfair, deceptive, or fraudulent practices. In the process, they often ignore dynamics or problems outside their direct mandate.

Embracing a holistic mindset suggests that in adopting and revising the rules governing finance, policy makers should take a broader perspective. It would encourage regulators to see the markets and institutions they are seeking to change as part of a vast, complex, and constantly evolving financial ecosystem that is itself part of an even more vast, complex, and evolving social system. This doesn't mean that all of these effects would or could be taken into account, but it would mean recognizing the potential for adverse ripples in other domains and coordinating with others earlier and more often.

A holistic mindset also brings to the fore the value of surveying the landscape for areas of opportunities or emerging, systemic issues that have not yet congealed enough to be salient using a more conventional lens. This could take the form of devising new ways to aggregate information currently held by different regulators to produce more complete and accurate depictions of how the financial system current works. It could also involve developing or incorporating new metrics to assess the health of that broader ecosystem, the role and perceptions of finance within society, and other factors. Although academics have made some progress in this regard, as reflected by SRISK and other measures of systemic risk, regulators have not yet established mechanisms for responding to the information embedded in these signals. This information might be used to redefine the problems that financial regulation is designed to address. More importantly, this process would be motivated by and reinforce an abiding humility about how much is known and understood at any given time.

In time, a more holistic approach to financial regulation could be operationalized through changes in the processes by which this regulation is made. The conventional approaches that produced Basel III, money market regulation, and other post-crisis reforms bear all the hallmarks of a single-shot game: a malignancy is identified, alternative treatments are weighed and measured, and the most desirable treatment is enacted into law, fleshed out in regulation, supervised, and enforced. Underpinning this approach is the assumption that policymakers can and should prescribe the optimal course of treatment—

[213] General The Right Hon. J.C. Smuts, HOLISM AND EVOLUTION 15 (MacMillan & Co., 3d ed., 1936) (1926), https://reflexus.org/wp-content/uploads/Smut-Holism-and-Evolution.pdf.

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that they can "get it right." This assumption is evident in procedural rules—statutory or agency requirements for CBA being one prominent example—that are ostensibly designed to ensure a degree of certainty around the impact of new regulation. It is also evident in the absence of institutional mechanisms designed to periodically assess the impact of new regulation after it comes into force. Yet as our case studies clearly illustrate, policymakers almost inevitably fail to accurately predict the impact of their decisions: not simply because they "get it wrong," but because these decisions unleash consequences that would have been almost impossible to predict at any point during the process of designing new regulation.

In contrast, a defining feature of a holistic approach is that regulation is recognized to function as a continuous game. This has two important implications. The first is the necessity of institutional mechanisms designed to facilitate the aggregation, analysis, and dissemination of information with a view to promoting ongoing learning within the regulatory community. The function of these mechanisms would not be limited to simply evaluating the costs and benefits of new regulation. Instead, these mechanisms would seek to monitor and evaluate ongoing structural changes to the financial system, assess the impact and effectiveness new regulation, and better understand the role and perceptions of finance within wider society. This in turn leads to the second implication: the need for flexibility in the processes governing the formulation, adoption, and revision of regulation. This flexibility is essential in order to ensure that new information is incorporated into the decision-making process and, ultimately, reflected in new regulation.[214] Together, these processes reflect the view that change is both inevitable and endogenous, and that efforts to optimize financial regulation are therefore equivalent to building castles in the sky.

A related benefit of a more holistic approach is that, properly operationalized, it could help to address the legitimacy and accountability issues that continue to loom large in finance. The complexity of the financial system not only means that rules often have consequences no one foresaw, it also places those who are not financial experts at a marked disadvantage in regulatory debates. The result, too often, is disengagement and distrust. By compelling reconsideration of policy tradeoffs outside of crises periods, and doing so at a time when there is more meaningful information available about the actual effects of a contested rule or scheme, there is at least the possibility of broader engagement and feedback.

Lastly, a more holistic approach to financial regulation might also yield different outputs of the regulatory process than the current regime. As vividly illustrated by the development of the Basel capital and liquidity rules, the ongoing quest for optimization has led to the adoption of an increasingly rigid and complex regulatory rulebook. This rulification is a product of pervasive regulatory arbitrage, the resulting reluctance on the part of elected officials to allocate discretion to either regulatory authorities or market participants, and the misplaced belief that—in time—policymakers will be able to strike the optimal balance between competing priorities and objectives. By abandoning the idea that

[214] It is at this point that the distinction between macroprudential and holistic approaches becomes most evident: while the creation of institutions such as the OFR and FSOC may initially appear to reflect a holistic approach, their institutional design imposes significant constraints on their ability to collect information, feed it into the policy process and, ultimately, take action on the basis of it.

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this type of optimization is possible, holistic approaches would enable regulators to adopt a more pragmatic stance: one based not on the tired "rules versus discretion" debate, but on their experiences of how these different tools work (or do not) in various regulatory contexts. By the same token, knowing that regulators have the flexibility to adapt rules in response to changing circumstances may also reduce the incentives of market participants to invest significant resources in finding ways to circumvent them. In this way, more holistic approaches are arguably less likely to produce regulatory rulebooks that contribute to the dynamism and complexity of the financial system.

Conclusion

Examining the processes that undergird financial regulation in light of the realities of modern finance helps to explain why the resulting rules so often fail to achieve their purported aims. This mismatch also helps explain why so many Americans remain distrustful of Congress and others charged with making rules, in addition to distrusting the financial sector they regulate. Efforts to improve financial regulation must grapple more directly with these fundamental process failures for there to be any hope of better outcomes in the years ahead. There are no easy answers, and this Article does not purport to provide them. Nonetheless, it does suggest that a more holistic mindset could help mitigate many of these challenges, and that a profound shift is needed given the magnitude of the mismatch between the nature of modern finance and the processes through which it is regulated.

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