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RegTech and Predictive Lawmaking: Closing the RegLag Between Prospective Regulated Activity and Regulation

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REGTECH AND PREDICTIVE LAWMAKING: CLOSING THE REGLAG BETWEEN PROSPECTIVE REGULATED ACTIVITY AND REGULATION

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ABSTRACT

Regulation chronically suffers significant delay starting at the detectable initiation of a "regulable activity" and culminating at effective regulatory response. Regulator reaction is impeded by various obstacles: (i) confusion in optimal level, form and choice of regulatory agency, (ii) political resistance to creating new regulatory agencies, (iii) lack of statutory authorization to address particular novel problems, (iv) jurisdictional competition among regulators, (v) Congressional disinclination to regulate given political conditions, and (vi) a lack of expertise, both substantive and procedural, to deploy successful counter-measures. Delay is rooted in several stubborn institutions, including libertarian ideals permeating both the U.S. legal system and the polity, constitutional constraints on exercise of governmental powers, chronic resource constraints including underfunding, and agency technical incapacities. Therefore, regulatory prospecting to identify regulable activity often lags the suspicion of future regulable activity or its first discernable appearance. This Article develops the regulatory lag theory (RegLag), argues that regulatory technologies (RegTech), including those from the blockchain technology space, can help narrow the RegLag gap, and proposes programs to improve regulatory agency clairvoyance to more aggressively adapt to changing regulable activities, such as by using promising anticipatory approaches.

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INTRODUCTION

"Regulable activities" present a durable, and to some extent an irreconcilable political conundrum. How do we determine which activities individuals, firms, and regulators should either not engage in, or engage in differently? "Wrongs" is the simple, traditional answer, but often rings hallow to libertarians, many of whom have varying definitions of what that might mean. Political economists criticize, and sometimes defend, third party effects—particularly negative externalities.[1] However, perhaps more pragmatically defined here, regulable activities arise from actions that spark public outrage, academic criticism, concerted political responses, judicial censure, and utopian propositions. Generally speaking, lawmakers around the globe have adopted a similar range of regulatory strategies to deal with regulable activities. Such strategies include banning certain activities; regulatory passivity; passing new legislation or granting permission on a case-by-case basis; and adopting a more interactive approach between private sector players and regulators, like the implementation of innovation offices, accelerators, and sandboxes.[2]

But, regulators world-wide are often hamstrung in defining regulable activity by one or more of the following: (i) strict constructionism;[3] (ii) opacity;[4] (iii) narrowly defined wrongs too often resulting from political compromise;[5] (iv) wrongdoer stealth;[6] and/or (v) limited investigatory and enforcement budgets or

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1. *See, e.g.*, Hal R. Varian, *A Solution to the Problem of Externalities When Agents Are Well-Informed*, 84 AM. ECON. REV. 1278 1994) (discussing third party costs).

2. *See generally* AURELIO GURREA-MARTÍNEZ & NYDIA REMOLINA, GLOBAL CHALLENGES AND REGULATORY STRATEGIES TO FINTECH (2020).

3. Politicians that want judges to exercise "judicial restraint" or avoid "judicial activism," also support—as President Nixon referred to in his famous terminology—a judicial philosophy of "strict constructionism." *See* Bryan H. Wildenthal, *Judicial Philosophies in Collision: Justice Blackmun, Garcia, and the Tenth Amendment*, 32 ARIZ. L. REV. 749, 750 (1990) (explaining that strict constructionism implies "obedience to the plain words of the Constitution itself. According to this philosophy, judges should adhere to the precise language of the Constitution, and only strike down laws which clearly violate a specific constitutional provision.").

4. In recent years, many have discussed the opacity problem in the context of algorithms. *See, e.g.*, Ignacio N. Cofone, *Algorithmic Discrimination Is an Information Problem*, 70 HASTINGS L. J. 1389, 1437 (2019) ("Opacity introduces a regulatory problem not only because decision-subjects may have a right to an explanation, but also because it makes it more difficult to create an environment that reduces the existence of biases, and it limits the application of doctrines such as disparate impact. It is difficult, in other words, to correct a decision-making process that we cannot access or understand.").

5. *See, e.g.*, Arthur E. Wilmarth, Jr., *Narrow Banking: An Overdue Reform That Could Solve the Too-Big-to-Fail Problem and Align Us and Uk Financial Regulation of Financial Conglomerates (Part 1)*, BANKING & FIN. SERVICESSERV, REP.1, 16–17 (2012) ("large financial institutions continued their aggressive lobbying campaign to weaken the Volcker rule during the conference committee's deliberations on the final terms of Dodd-Frank. The conference committee accepted a last-minute compromise that significantly weakened the Volcker.").

6. *See, e.g.*, 2 JAMES T. O'REILLY, FOOD & DRUG ADMIN. § 29:34 (Katharine A. Van Tassel ed., 2d ed. 2020) (discussing stealth regulatory scheme and how wrongdoers might try to take

agency expertise.[7] This situation is precisely the limit sought by many libertarians; to whom liberty is enhanced by effectively limiting government power to address societal needs without first expending great cost from limited resources. It almost guarantees that regulatory responses will lag nearly any initial perception of perceived wrongs. Activities susceptible to eventual, broad perception of wrongfulness are arguably regulable. This Article focuses on a Regulatory Lag (RegLag) theory, which is somewhat similar to the "Law Lag" concept discussed in recent law and technology literature—connected with attempts to regulate new technology-driven products and services—but more inclusive.[8]

RegLag is not ideal, which is why, in recent years, administrative law experts have focused on ways for lawmakers to be able to quickly and effectively make novel legal and policy changes when needed. One example is the use of guidance documents, but that practice has long been controversial and considered one of the most challenging aspects of administrative law.[9] Likewise, another way could be via actions that government and regulatory agencies take in

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advantage of certain situations or laws to give all sorts of different impressions to consumers, such as "We are FDA regulated" that may be interpreted by consumer to mean "We are safe.").

7. Likewise, because of limited enforcement and investigatory budgets, regulators are required to make difficult decisions regarding how and who to pursue when enforcing the law. *See, e.g.*, Futernick v. Sumpter Township, 78 F.3d 1051, 1058 (6th Cir.), *cert. denied*, 519 U.S. 928 (1996); In re B & R Oil Co., 8 E.A.D. 39, 52–53 (EAB 1998).

8. "Law lag" or "legal lag" are phrases that have been used in law and technology literature in connection with situations in which "existing legal provisions are inadequate to deal with a social, cultural or commercial context created by rapid advances in information and communication technology." Jeremy Pitt & Ada Diaconescu, *The Algorithmic Governance of Common-Pool Resources*, *in* FROM BITCOIN TO BURNING MAN AND BEYOND: THE QUEST FOR IDENTITY AND AUTONOMY IN A DIGITAL SOCIETY 130, 137–38 (John H. Clippinger & David Bollier eds., 2014); *see* Carla L. Reyes, *Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal*, 61 VILL. L. REV. 191, 202 (2016) (explaining law lag in the context of distributed ledger technology and its regulation); *see* Thomas R. McLean, *The Offshoring of American Medicine: Scope, Economic Issues and Legal Liabilities*, 14 ANNALS HEALTH L. 205, 254 (2005) (discussing things that tend to limit the legal lag time associated with telemedicine technology and usages); Michael L. Rustad & Thomas H. Koenig, *Cybertorts and Legal Lag: An Empirical Analysis*, 13 S. CAL. INTERDISC. L.J. 77 (2003) (showcasing how Richard Nixon, in 1936, reflected on how within one generation, automobile liability law became so developed that the size of a comprehensive review grew from a few-page document to an entire encyclopedia); Michael L. Rustad & Maria Vittoria Onufrio, *The Exportability of the Principles of Software: Lost in Translation*, 2 HASTINGS SCI. & TECH. L.J. 25, 29 (2010) (demonstrating how "[i]n the case of software law, there has been a forty-year 'legal lag' between the rises of software as a separate industry and the development of specialized contracting principles."). In this Article we focus on "RegLag," which is similar to "law lag," or "legal lag," but broader as it does not specifically refer to circumstances in which the lag results from technologically-driven changes, but generally to situations in which new regulation is needed to address new types of "wrongs" or new should-be-regulable types of activities. "Law lag" or "legal lag" in that sense, are terms that closely follow the understanding that "[l]aw lags science; it does not lead it." Rosen v. Ciba-Geigy Corp., 78 F.3d 316, 319 (7th Cir. 1996).

9. *See, e.g.*, Ming Hsu Chen, *How Much Procedure Is Needed for Agencies to Change "Novel" Regulatory Policies*?, 71 HASTINGS L.J. 1127 (2020) (explaining that when a government agency uses a guidance document to change or make policy, it need not provide notice to the public or enable comment on the new rule; this makes legal and policy changes easier and faster).

investigations and enforcement proceedings.[10] These methods are part of what has become known as administrative constitutionalism legal scholarship—a catchphrase for literature that explores the role of administrative agencies in influencing, creating, and establishing constitutional standards and norms, and governing based on those.[11] This Article has some overlap with administrative constitutionalism scholarship advocating for a different way to handle RegLag: by using Regulatory Technology (RegTech), including those from the blockchain technology space, to reduce RegLag by modifying the types of regulable activities, and by using technology-enabled anticipatory approaches ("Anticipatory RegTech Model").

This Article's proposal of using RegTech to help narrow RegLag gaps uses analogies and borrows insights from theories of 'adaptive law' and resilience-and-law.[12] Indeed, studying how environmental law should be constantly changing to increase its adaptive capacity to faster and better regulate evolving life circumstances is useful, and we advocate for harnessing the power of RegTech to improve this adapting process. An adaptive law system is one that "facilitates social and ecological resilience through moderate evolution in rules, standards, processes, and structures as the system adapts to changing conditions."[13] Resilience-and-law scholars give importance to adaptive management.[14] Adaptive management is an iterative management process that assumes knowledge relies experimentation: with feedback loops, monitoring, learning, and changes based on what is learned in real-time, constantly updating predic-

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10. Suspecting that President Trump is attempting to limit in many ways the actions that agencies can take in investigations and enforcement proceedings, on January 30, 2020, the OMB published a Notice entitled "Comments of Richard J. Pierce, Jr. on Promoting the Rule of Law Through Transparency and Fairness in Civil Administrative Enforcement and Adjudication." In the Notice the OMB solicited comments on the issues of fairness of the adjudication procedures that agencies use in enforcement proceedings. *See* RICHARD J. PIERCE Jr., COMMENTS OF RICHARD J. PIERCE, JR. ON PROMOTING THE RULE OF LAW THROUGH TRANSPARENCY AND FAIRNESS IN CIVIL ADMINISTRATIVE ENFORCEMENT AND ADJUDICATION 1 (2020).

11. *See* David E. Bernstein, "*Administrative Constitutionalism:" Considering the Role of Agency Decisionmaking in American Constitutional Development* (forthcoming 2020).

12. Other scholars have also argued that environmental justice scholarship helps to address gaps in legal literature relating to adaptation law and resilience. *See, e.g.,* Joseph Wenta, Jan McDonald & Jeffrey S. McGee, *Enhancing Resilience and Justice in Climate Adaptation Laws,* 8 TRANSNATL. ENVIRON. L. 89 (2019).

13. Craig Anthony (Tony) Arnold, *Resilient Cities and Adaptive Law*, 50 IDAHO L. REV. 245, 253 (2014).

14. *Id. See also* Alejandro E. Camacho, *Adapting Governance to Climate Change' Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1, 16–24 (2009); Robin Kundis Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 VAND. L. REV. 1, 16–26 (2014).); Robert L. Glicksman, *Ecosystem Resilience to Disruptions Linked to Global Climate Change' An Adaptive Approach to Federal Land Management*, 87 NEB. L. REV. 833, 865-91 (2009); Bradley C. Karkkainen, *Adaptive Ecosystem Management and Regulatory Penalty Defaults: Toward a Bounded Pragmatism*, 87 MINN. L. REV. 943, 946–56 (2003).

tions of what is to come.[15] Adaptive management is partially practiced by federal agencies that handle environmental matters, such as the managing of forests, wetlands, and river systems,[16] but this Article argues that all regulators could benefit from learning more about it and how to utilize RegTech to effectively address trends and changing circumstances. For example, using RegTech to better manage, regulate, and shorten RegLag gaps has already proven efficient in the context of smart cities—an area in which legal scholars have discussed the context of adaptive management and the importance of the presence of an adaptable legal system.[17] Toward this goal, regulators that adopt surveillance technology and rely on data collection for the allocation and management of resources do so to constantly try to predict future challenges and trends.[18]

There is no reason not to expand the use of RegTech to all lawmakers to help them adapt more aggressively to changing regulable activities by using promising anticipatory approaches. An emerging community of scholars, regulators, service providers, consultants, and information technologists now understand the advantages and power of RegTech.[19] RegTech promises to address contemporary challenges confronting regulatory programs by achieving statutory missions while remaining politically responsive. RegTech is disruptive to previously stable legacy compliance approaches currently taken by regulatory agencies and regulated entities.[20] Disruption is predictable for the primary legacy regulatory methods used by regulatory agencies, including: (1) statutory mission interpretation, (2) agency workforce training and adaptation, (3) policymaking and rulemaking, (4) monitoring and maintenance of regulatory systems, (5) investigations, (6) sensor operations, (7) data collection, (8) enforcement, (10) litigation and dispute resolution, (11) development and announcement of regulatory guidance, (12) oversight of self-regulatory organizations (SROs), and (13) agency hiring and procurement.

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15. *See generally* C.S. HOLLING ET AL., ADAPTIVE ENVIRONMENTAL ASSESSMENT AND MANAGEMENT (C.S. Holling ed., 1978).

16. *See, e.g.*, Camacho, *supra* note 14, at 25–36.

17. *See, e.g.*, Janine S. Hiller & Jordan M. Blanke, *Smart Cities, Big Data, and the Resilience of Privacy*, 68 HASTINGS L.J. 309, 324–25 (2017) (explaining how it has become clear that building resilient cities must include working on a constantly updating disaster response, economic planning for land use and urban growth, bridging physical and human communities, and much more).

18. *Id.* at 354.

19. *See, e.g.*, Eva Micheler & Martyna Sucharzewska, Conference Report, *Technology in Finance, Law and Regulation—Taking Stock*, 38 LONDON SCH. ECON. L. POL'Y BRIEFING SERIES 2, 4 (2019).

20. *See, e.g.*, *RegTech Universe 20202021*, DELOITTE, https://www2.deloitte.com/lu/en/pages/technology/articles/regtech-companies-compliance.html; *Regtech compliance disruption growing; spending will reach $115.9 billion,* PAYMENTSNEXT, https://paymentsnext.com/regtech-compliance-disruption-growing-spending-will-reach-115-9-billion/; Arun Suresh, *RegTech: A new disruption in the financial services space*, PWC INDIA, https://www.pwc.in/consulting/financial-services/fintech/fintech-insights/regtech-a-new-disruption-in-the-financial-services-space.html.

RegTech alternatives are likely appropriate for local, state, federal and multi-national regulatory bodies. They are also likely appropriate for SROs, and this Article broadly defines RegTech to include SRO regulatory activities such as licensing, disclosure, enforcing professionalism and consequences, and dispute resolution. Considerable deregulation literature since the 1990s advocated self-regulation by private professions, regulation by non-governmental organizations (NGO), and other "soft" regulatory techniques as preferable to invocation of the power and social costs of operating governmental regulatory systems.[21] For example, online alternative dispute resolution (Online ADR a/k/a ODR) systems deployed by regulators, courts,[22] and NGOs show promise to improve efficiency and gain success.[23] This Article reviews experience, sustainability, and future prospects for RegTech deployment at almost any level of authority. It argues that RegTech can narrow the RegLag gap by improving regulatory agencies' ability to perceive events or gain data to assess future trends and directions—a key ability for adaptive governance and the successful functioning of agencies, as it helps adapt to changing and better capturing regulable activities.[24]

I. DEFINING REGULATORY TECHNOLOGY (REGTECH)

"RegTech" reflects a growing reliance on information technology as the main tool of regulation and supervision—"including regulatory data collection,

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21. *See, e.g.*, Colin Scott, *Private Regulation of the Public Sector: A Neglected Facet of Contemporary Governance*, 29 J.L. & SOC'Y 56 (2002); *but see* David Vogel, *The Private Regulation of Global Corporate Conduct: Achievements and Limitations*, 49 BUS. & SOC'Y 68 (2010) (arguing private regulation has resulted in some substantive improvements in corporate behavior, it cannot be regarded as a substitute for the more effective exercise of state authority at both the national and international levels).

22. *See, e.g.*, Heather Kulp & Amy J. Schmitz, *Real Feedback from Real People: Emphasizing User-Centric Designs for Court ODR*, 26 DISP. RESOL. MAG. 6 (2020).

23. For example, the Uniform Domain Name Dispute Resolution Policy (UDRP), launched in late 1999, arguably settles trademark and other aspects of disputed domain name registrations more efficiently than IP trials at law. Given the Internet is an inherently international medium, judicial resolution of domain name disputes would often be cost prohibitive. The UDRP was initiated by the World Intellectual Property Organization (WIPO) deploying online dispute resolution using electronic and expert human facilities of ICANN (Internet Corporation for Assigned Names and Numbers). As a non-judicial, online ADR method, the UDRP represents a RegTech mechanism, successfully settling thousands of cases involving both national and international disputes. The UDRP exemplifies successful SRO-management. *See generally* John W. Bagby & John C. Ruhnka, *Protecting Domain Name Assets*, 74 C.P.A.J. at 64, 69 (2004).

24. It is true that "[t]o expect clairvoyance or perfection from regulatory agencies would indicate a complete lack of reality." Kevin Kinder, *Friendly Skies or Turbulent Skies: An Evaluation of the U.S. Airline Industry and Antitrust Concerns*, 91 S. CAL. L. REV. 943, 981 (2018). However, regulatory agencies' clairvoyance is critical for their successful functioning. *See, e.g.*, Alabama-Tennessee Nat. Gas Co. v. Fed. Power Comm'n, 359 F. 2d 318, 339 (5th Cir. 1966) (the court held that it was correct for the government commission's decision to depend on its understanding and reading of what it believes will happen in future, but that clairvoyance is significant part of a regulatory agency's daily grind).

processing, and monitoring of compliance."[25] RegTech is a disruptive phenomenon, impacting legacy regulatory enforcement and compliance program techniques, requiring well-reasoned, standard policy principles.[26] The United Kingdom's Financial Conduct Authority (FCA) was the first to refer to this growing sector as such, and describe how it applies to a subcategory of new technologies that could better handle regulatory challenges and cybersecurity hazards.[27]

Even though RegTech has received much attention from the media, scholars, and the private sector,[28] it is still challenging to accurately define "RegTech" as its early exploration period has yet to settle into a steady state. Early devotees, product and service vendors, consultants, scholars, and interlopers of emerging fields typically vie to leave their mark on the body of knowledge, the direction of incremental developments,[29] and the general understanding of the field's importance. Each participant's influence is likely dominated by their own interests and abilities. Their ultimate influence, however, is likely limited by their inabilities, predispositions, and prejudices. Early stages of a new field's activity present a cacophony of perspectives. Several contemporary examples are evident, such as smart contracts,[30] cryptocurrencies,[31] blockchain distributed ledger,[32] financial technologies,[33] and AI analysis[34] based on big data.[35] RegTech is unlikely to be an exception.[36]

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25. Saule T. Omarova, *Technology v. Technocracy: Fintech as a Regulatory Challenge*, 6 J. FIN. REG. 75, 101 n.119 (2020).

26. *See* Eva Micheler & Johannes Jiang, *Regulatory Technology - Eight Policy Recommendations* (LSE LAW POL. BRIEFING PAPER NO. 37, 2019), https://ssrn.com/abstract=3423899 or http://dx.doi.org/10.2139/ssrn.3423899.

27. Michael Piri, *The Changing Landscapes of FinTech and RegTech: Why the United States Should Create a Federal Regulatory Sandbox,* 2 BUS. & FIN. L. REV., 233, 240 (2019).

28. *See, e.g.*, Tom Butler, *Towards a Standards-Based Technology Architecture for RegTech* 45 J. FIN. TRANSFORMATION 49 (2017).

29. Some participants may claim their contributions are transformative.

30. Lennart Art, *Smart Contracts on the Blockchain – A Bibliometric Analysis and Review* (BRL Working Paper Series No. 10, 2020), https://ssrn.com/abstract=3576393 or http://dx.doi.org/10.2139/ssrn.3576393 (classifying emerging smart contract literature review using algorithmic bibliographic categorization into intra-disciplinary tranches; here, a STEM perspective on refining the smart contract architecture through innovation, a business and economics view of smart contract business implications, and the policy perspective on contracting regimes).

31. *See, e.g.*, Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller & Steven Goldfeder, BITCOIN AND CRYPTOCURRENCY TECHNOLOGIES: A COMPREHENSIVE INTRODUCTION (2016).

32. *See, e.g.*, *Symposium: Blockchain Technology, Cryptoassets & the Law*, 88 UMKC L. REV. 235, 235–517 (Winter 2019); Carla L. Reyes, Nizan Geslevich Packin & Ben Edwards, *Distributed Governance*, 59 WM. & MARY L. REV. ONLINE 1 (2017), https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1003&context=wmlronline.

33. *See, e.g.*, Franklin Allen, Xian Gu & Julapa A. Jagtiani, *A Survey of Fintech Research and Policy Discussion* 1 (Fed. Reserve Bank of Phila., Working Paper No. 20–21, 2020) https://ssrn.com/abstract=3622468 (providing comprehensive FinTech literature review, including, "[m]arketplace and peer-to-peer lending, credit scoring, alternative data, distributed ledger technologies, blockchain, smart contracts, cryptocurrencies and initial coin offerings, central bank digital currency, robo-advising, quantitative investment and trading strategies, cybersecurity, identity theft,

Whatever RegTech's main field may be, scholars believe it represents a trend toward "the automation and streamlining of regulatory processes."[37] Some argue information technologies dominate in RegTech, including technological developments of the past 20 years, such as, *inter alia*, cloud computing, artificial intelligence analysis of big data, service provider systems (e.g., SaaS, IaaS) and the integration of direct monitoring feeds fused from sensors at regulated entities.[38] The early-on conception that RegTech is a mere subset of FinTech or a corollary to it[39] may be myopic, given the generalizability of both regulator techniques and compliance processes.[40] This "sectoral" focus was likely reinforced by early and seemingly successful vendors of RegTech solutions who dominated RegTech's early significance.[41] Great examples of this include the privacy solution product industry's players, such as vendor executives, product demonstrations, and engineers who have promoted toothless trainings, audits, paper trails, and other privacy compliance symbols rather than actual adherence to privacy law.[42] Likewise, much of RegTech's earlier focus

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cloud computing, use of big data and artificial intelligence and machine learning, identity and fraud detection, anti-money laundering, Know Your Customers, natural language processing, regtech, insuretech, sandboxes, and fintech regulations"); *see also* John Bagby & David W. Reitter, *Anticipatory FinTech Regulation: On Deploying Big Data Analytics to Predict the Direction, Impact and Control of Financial Technology* (2019) https://ssrn.com/abstract=3456844 (chronicling historical accretion of FinTech innovations by financial institutions, governments, regulators and SROs).

34. Simon Chesterman, *Through a Glass, Darkly: Artificial Intelligence and the Problem of Opacity* (NUS L., Working Paper No. 2020/011, 2020), https://ssrn.com/abstract=3575534.

35. *See, e.g.*, John W. Bagby, *Scope of Field: On Defining Big Data Analytics Field Development in Research and Curricular Design* (Research Symposium: Law & Ethics of Big Data, 2020), https://ssrn.com/abstract=3631182.

36. Nizan Geslevich Packin, *Regtech, Compliance and Technology Judgment Rule*, 93 CHI.-KENT L. REV. 193, 207 (2018).

37. Saule T. Omarova, *Dealing with Disruption: Emerging Approaches to Fintech Regulation*, 61 WASH. U. J.L. & POL'Y 25, 48 (2020).

38. *See generally* DAVID L. HALL ET AL., MATHEMATICAL TECHNIQUES IN MULTISENSOR DATA FUSION (2nd ed. 2004); Multi-Sensor Fusion, U.S. Patent No. 7,283, 904B2 (filed Oct.17, 2001) (issued Oct. 16, 2007), https://patents.google.com/patent/US7283904B2/en.

39. *See, e.g.*, *Fintech and Regtech Win Over Compliance Skeptics*, THOMSONREUTERS, https://legal.thomsonreuters.com/en/insights/articles/fintech-and-regtech-win-over-compliance-skeptics; Douglas W. Arner, Jànos Barberis & Ross P. Buckley, *FinTech, RegTech, and Reconceptualization of Financial Regulation*, 37 NW. J. INT'L L. & BUS. 371, 376 (2017); Lawrence G. Baxter, *Adaptive Financial Regulation and RegTech: A Concept Article on Realistic Protection for Victims of Bank Failures*, 66 DUKE L. J. 567 (2016); Luca Enriques, *Financial Supervisors and RegTech: Four Roles and Four Challenges*, REVUE TRIMESTRIELLE DE DROIT FINANCIER 53 (2017).

40. *See, e.g., Regulatory Technology (RegTech)*, ERNST & YOUNG (Mar.14, 2019), https://assets.ey.com/content/dam/ey-sites/ey-com/en_us/topics/financial-services/ey-regulatory-technology-regtech.pdf.

41. Douglas W. Arner, Jànos Barberis & Ross P. Buckley, *The Emergence of RegTech 2.0: From Know Your Customer to Know Your Data*, 44 J. FIN. TRANSFORMATION 79, 79–86 (2016).

42. *See* Ari Ezra Waldman, *Privacy Law's False Promise*, 97 WASH. U. L. REV. 773 (2020) (manuscript at 3, 64), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3339372 (explaining the process-oriented approaches to compliance in connection with privacy protections).

was on the massive amounts of new regulation since the 2008 banking crisis which financial industry players had to face in an efficient, effective and cheap way.[43]

A. *Deploying Limiting Principles to Defining RegTech*

RegTech is an application of technology to many, perhaps even to most, regulatory matters.[44] There is no inherent limitation of RegTech to any particular industry or sector like financial services.[45] FinTech applications of RegTech innovations are not limited to creating or testing compliance[46] methods deployed by regulated entities.[47] Further, financial services is not the only industry adapting their regulatory compliance methods to information technologies.[48] For example, applying various technologies as regulatory tools to handle completely different issues, such as food safety, traceability, authenticity, and sustainability, is dependent on the "code as law" approach. This approach, which is one of many, focuses on regulation as a method with:

> "command and control rules, social norms, industry standards, market and architecture, and computer codes. Indeed, technology can be "regulatory" and compliance-driven through different mechanisms to make "regulation [a] sustained and focused attempt to alter the behavior of others according to defined standards or purposes to produce a broadly identified . . . outcomes, which may involve mechanisms of standard-setting, information-gathering[,] and behavior-modification." Just as information and telecommunication technology can force compliance by building in

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43. Gregory Roberts, *Fintech Spawns Regtech to Automate Compliance with Regulations*, BLOOMBERG PROF'L SERVS. (June 28, 2016), https://www.bloomberg.com/professional/blog/fintech-spawns-regtech-automate-compliance-regulations.

44. *See generally* Lawrence G. Baxter, *Adaptive Financial Regulation and RegTech: A Concept Article on Realistic Protection for Victims of Bank Failures*, 66 DUKE L. J. 567 (2016).

45. Google Scholar search of "RegTech" provides some evidence that the top results since 2016 have a primary focus on financial services, financial crimes and security, and privacy.

46. *See* Brandon L. Garrett & Gregory Mitchell, *Testing Compliance*, 83 Law and Contemporary Problems (unpublished manuscript) (on file with the Duke L. Scholarship Repository), https://ssrn.com/abstract=3535913.

47. *See, e.g.*, John W. Bagby & David Reitter, *Anticipatory FinTech Regulation, supra* note 33 (arguing FinTech innovations by regulators and SROs are leading exemplars of RegTech and induce compliance RegTech solutions). *But see* Jake Frankenfield, *What You Should Know About RegTech*, INVESTOPEDIA (Apr. 27, 2019), https://www.investopedia.com/terms/r/regtech.asp (arguing for a narrow definition of RegTech: "Regtech is the management of regulatory processes within the financial industry through technology. The main functions of regtech include regulatory monitoring, reporting, and compliance. Regtech, or RegTech, consists of a group of companies that use cloud computing technology through software-as-a-service (SaaS) to help businesses comply with regulations efficiently and less expensively.").

48. *See, e.g.,* Lyria Bennet Moses & Monika Zalnieriute, *Law and Technology in the Dimension of Time*, TIME, LAW AND CHANGE: AN INTERDISCIPLINARY STUDY (Sofia Ranchordás & Yaniv Roznai eds., 2020) (manuscript at 8), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3461408; Corporate Compliance & Ethics, https://www.corporatecompliance.org/ (claiming representation of compliance and ethics professionals "across all industries."). Also, catalog prominent RegTech methods in industries outside financial services.

> automatic braking at stop signs for self-driving cars . . . [technology] can *de facto* shape what is permissive, possible, prohibited, or impossible."[49]

Finally, compliance is not the only RegTech perspective that matters when the ultimate goal is achieving proficiency in regulatory process design, implementation, and maintenance resulting in deeper understanding of the efficacy of innovative methods.[50] Indeed, RegTech may force a revolution in how legal scholarship addresses both administrative law and the regulatory state.[51] As with some other regulatory programs, not only entities, which are regulated tasked with monitoring relevant activities, but all market participants may be scrutinized by proposed RegTech deployment.[52]

Nevertheless, perhaps a limiting principle is needed in the near term to make this broad subject manageable. Such a principle might be needed if a comprehensive RegTech vision becomes unwieldy as to any or all regulatory methods, programs, agencies, and regulated industries worldwide. Perhaps it is instructive to consider how administrative regulation has Byzantine roots in human history where systematic practices followed well-articulated goals.[53] Regulatory process and administrative law have sustained considerable academic and practitioner interest in the modern era largely when analyzed as it has developed under U.S. law since the turn of the 20th Century.[54]

The New Deal experience with regulatory program initiation, unconstitutionality, and endurance likely contributed the most to regulation topics. U.S. sustained economic regulation was initially imposed in network industries as

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49. Ching-Fu Lin, *Blockchainizing Food Law: Promises and Perils of Incorporating Distributed Ledger Technologies to Food Safety, Traceability, and Sustainability Governance,* 74 FOOD & DRUG L.J. 586, 604–05 (2019).

50. Many scholars and practitioners of regulatory process and administrative law as well as compliance vendors and consultants and professional compliance organizations (SRO, bar associations, AICPA) claim expertise portable over various regulatory programs, industries, and jurisdictions. *See, e.g.*, SOCIETY OF CORPORATE COMPLIANCE & ETHICS, https://www.corporatecompliance.org/https://www.corporatecompliance.org/about-scce (last visited Feb. 27, 2021) (claiming representation of compliance and ethics professionals "across all industries").

51. *See, e.g.*, Vicki C. Waye, *Regtech: A New Frontier in Legal Scholarship*, 40 ADELAIDE L. REV. 363 (2019) (arguing RegTech enhances opportunities for legal scholarship given RegTech's automated compliance systems and meeting the burden of increased regulatory complexity).

52. *See, e.g.*, Nika Pranata & Alan Ray Farandy, *Big Data-Based Peer-to-Peer Lending Fintech: Surveillance System through Utilization of Google Play Review* (ADBI Working Paper 943, 2019) (analyzing Google Play data for FinTech innovations like peer-to-peer (P2P) lending here in Indonesia where the influence of Islamic finance may impact lending practices); Rüdiger Fahlenbrach & Marc Frattaroli, *ICO Investors* (Swiss Finance Institute Research Paper No. 19-37), *available at* https://ssrn.com/abstract=3419944 (analyzing pseudonymous transactions identified by an Ethereum address that may conceal beneficial owners).

53. *See, e.g.*, ANGELIKI E. LAIOU, THE ECONOMIC HISTORY OF BYZANTIUM: FROM THE SEVENTH THROUGH THE FIFTEENTH CENTURY (Dumbarton Oaks, 2002).

54. Pre-Interstate Commerce Commission (ICC) regulation in the U.S. arose in narrow, sometimes episodic fits and spurts. Of course, tax collection is longstanding through human history. Regulation of commodities and war material repeatedly occurs during conflict.

rate-setting under the Interstate Commerce Act of 1887.[55] Similarly, major economic changes took place during the years following the 2008 financial crisis. The 2010's were characterized by an unprecedented growth in compliance laws and regulations,[56] which included, *inter alia,* the creation of the Financial Stability Oversight Council—which oversees financial institutions; implements and enforces consumer-related finance compliance regulations; establishes requirements for large companies; and examines corporate governance, executive compensation practices, and investor protection financial institutions.[57] RegTech has evolved from a narrow, compliance system vendor orientation through financial services innovation from both regulatory agency and regulated entity perspectives. RegTech is herein expanded to include technological advances on all sides of regulatory compliance, across any industry or activity regulated.[58]

B. *Cross-Cutting Themes from Administrative Law*

Research in administrative law and regulated industries has long indulged in generalization, particularly with standardization across agencies, industries, and

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55. Pub. L. 49–104, 24 Stat. 379 *codified as* 49 U.S.C. §101 *et. seq*. Transportation was deregulated incrementally, completed with abolition of the ICC in Dec. 1995 under the Interstate Commerce Commission Termination Act, Pub. L. 104–88, 109 Stat. 803. Numerous rate and mandatory service requirements made these regulated industries: freight rail, terminal rail switching services, passenger rail, over-the-road motor freight transport, airline service, passenger bus service, inter-urban passenger rail, and urban rail. Rate and mandatory service provision spread to energy and utilities (e.g., electricity, water, and sewer service), communications (e.g., landline telephone, cable TV service, Internet service provision, cellular telephone), and even the provision of heat (e.g., steam in NYC). Some argue any rate-setting by statute, rate setting tribunal, or regulatory agency rulemaking (informal notice and comment or formal) is a form of economic regulation. Others argue economic regulation exists any time regulation impacts the regulated entity's revenues, profitability or capital structure. *See generally*, John W. Bagby, James R. Evans, & Wallace R. Wood, *Contracting for Transportation,* 22 TRANSP. J. 63–73 (Winter 1982) (arguing some learning curve is required in the transition from rate regulation to more open free-market pricing and terms determination based on negotiated bi-lateral contracting in freight carriage services).

56. "Sarbanes-Oxley and Dodd-Frank are just two of the major pieces of recent federal legislation designed to regulate the United States economy." Renalia Smith DuBose, *Compliance-A Major Change in Employment Opportunities for Law School Graduates Fueled by Major Changes in the Economic History of the United States,* 35 W. MICH. & U. COOLEY L. REV. 1, 18 (2019); "In 2010, the Dodd-Frank [Act] . . . was passed and was the most extensive regulatory reform of American financial institutions since the Great Depression. It was passed as a result of the Great Recession. The Great Recession lasted from December 2007 to June 2009, during which time the real gross domestic product plummeted to its greatest decline since World War II. One of the primary reasons for this catastrophic event in America's economic history was the lack of regulation in the financial industry and too much reliance on the stability of large banks." *Id*. at 16–17.

57. *Id*.

58. *See* UNSGSA FINTECH WORKING GROUP & CAMBRIDGE CENTRE ALTERNATIVE FINANCE, EARLY LESSONS ON REGULATORY INNOVATIONS TO ENABLE INCLUSIVE FINTECH: INNOVATION OFFICES, REGULATORY SANDBOXES, AND REGTECH 31 (2019) (defining RegTech) ("[T]he usefulness of RegTech for regulators: for any objective they might have and with any technology that might help them better regulate and supervise a rapidly digitizing financial marketplace.").

regulated activities. Perhaps most importantly, the Administrative Procedure Act (APA) has achieved considerable consistency across U.S. federal agencies.[59] In the twentieth century, APA doctrinal jurisprudence dispersed to many of the states as the APA's principles survived Constitutional challenges and it became a well-balanced and efficacious rulebook.[60]

1. RegTech on the Compliance-Side

Another widely advocated limiting principle for RegTech is that it focuses primarily on compliance by regulated entities. Many early vendors were innovators in providing solutions to facilitate compliance by regulated entities. However, there are two problems with the solitary focus holding that RegTech is simply a form of compliance using information technology platforms.

First, this perspective more likely rewards sectoral vendors in particular industries. An excessively narrow conceptualization of RegTech places unreasonable blinders on both regulators and regulated industries. Perhaps some insight can be derived from European regulatory process scholars who make clear that recognition of RegTech in the EU likely predated much of the intensity of focus experienced in the U.S.[61]

RegTech is a giant field that can improve most of the regulatory tools, techniques, methods, and categories of activities by both regulators and regulated entities in their compliance, lobbying, commentaries, and political support or opposition.[62] Compliance technologies, approved by regulators, that facilitate regulator access to the products of compliance, such as direct feeds to disclosed information, periodic regulator monitoring, or audit of compliance technology, assist both regulated entity compliance and regulator investigations and enforcement. RegTech should be broadened to include both perspectives, regulators, and compliance.[63]

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59. 5 U.S.C. §551 *et. seq.*

60. Of course, there are some regulatory programs that "enjoy" APA exceptions or operate under statutory mandates endowing these agencies and programs with procedural rules separate from the APA. *See, e.g.*, John H. Frye III, *Survey of Non-ALJ Hearing Programs in the Federal Government*, 44 ADMIN. L. REV. 261 (1992) (generalizing about non-APA strictures); John D. Graham & James W. Broughel, *Stealth Regulation: Addressing Agency Evasion of OIRA and the Administrative Procedure Act*, 1 HARV. J.L.& PUB. POLICY 30 (Federalist ed.) (2014).

61. MICHÈLE FINCK, BLOCKCHAIN REGULATION AND GOVERNANCE IN EUROPE (Cambridge Univ. Press 2019).

62. *See* Omarova, *supra* note 37, at 49 (stating that "RegTech offers more than simply a new set of tools for increasing regulatory capacity—it potentially offers an alternative regulatory philosophy.").

63. Academic authors naturally focus on how RegTech compliance and the regulator's technologically enabled perspective will impact students. RegTech will integrate into the curricula of undergraduate and graduate education in business and information science disciplines as well as into law school curricula. Once generally known as Business Law and the Legal Environment of Business, business-oriented regulatory disciplines continue to evolve as the weight of emerging topics like RegTech become important to graduates as well as in faculty research. The regulatory component of curricular requirements for professional qualification and licensing also will drive the uptake

The second problem with the solitary focus on RegTech as a form of compliance using information technology platforms is that this perspective ignores that information technology can be used by businesses to evade regulations and frustrate regulators, a phenomenon referred to as anti-RegTech.[64] RegTech is a tool that enables companies to automate, grow more effective, and improve compliance, but this can only happen if we operate under the assumption that a company does what it is supposed to do. But the determination of what a company is supposed to do can look very different in the eyes of the company versus the government. The first is decided based on a company's leadership business and culture values,[65] and the other is the result of constantly changing and not-uniformly enforced regulations created by governmental agencies.[66]

Ethics are different from compliance. Ethics are concerned with doing the right thing because of a moral conviction. However, one obeys the law not because it is necessarily the right things to do, but because one is required to do so and has to meet a bare legal minimum—compliance.[67] A company can be compliant, but not be doing "the right thing." For example, the recent RegTech trend of banks seeking to automatically calculate precise capital allocations required to pass the government's stress tests while maximizing returns is con-

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of RegTech studies. Topics both typical to instruction and research at accredited programs in and outside the U.S. form a limiting principle for RegTech scholarship by faculty. This limitation may not be as restrictive because higher education in business scholarship generally explores a whole panoply of compliance methods and regulator activities enhanced by technology covering all regulatory programs and regulatory methods. For example, traditional regulatory program curricula in AASCB accredited programs, in both required and elective courses, could focus at least some RegTech attention. The recurring themes over the long term, particularly those having content assuming significant class-contact should initially be considered, such as, antitrust, securities regulations, financial services, environmental law, occupational safety and health, labor and employment, banking, and real estate. Additional topics could also be relevant to setting the RegTech scope, such as rate regulation in transportation, utilities, essential facilities, privacy, intellectual property (IP), technology management, communications, the Internet, insurance, food and drugs, health care, gambling, and insolvency management. Many of these fields of regulation overlap, such as how real estate involves professionalism and certification, environmental compliance, insolvency management, real estate financial services, hedging investments, and loan packaging.

64. *See* Packin, *supra* note 36, at 212–14.

65. SEC Chairman Christopher Cox spoke about best practices in establishing an ethical culture in U.S. companies. He said, "Without a doubt, the best practice of all in any company is to set the right tone at the top. Over and over again, commissioners and staff at the SEC observe that the tone at the top is a major factor in determining the effectiveness of internal controls to prevent fraud, in treating customers, employees, investors and other stakeholder fairly, and in contributing to the long-term success of the organization. Leadership by example, good communication, and ongoing ethics education and training are all vital." Frank C. Bucaro, *Q&A with Christopher Cox*, SPEAKER MAG. at 22 (Sept. 2007), http://www.nsaspeaker-magazine.org/nsaspeaker/200709/?pg=1#pg1.

66. *See generally* Eric C. Chaffee, *Creating Compliance: Exploring a Maturing Industry*, 48 U. TOL. L. REV. 429 (2017) (explaining that "business compliance is a field that focuses on prospectively ensuring adherence to laws and regulations through the use of monitoring, policies, and other internal controls," and stating several events in the history of the modern corporation that have spurred the current period of rapid growth in the compliance field).

67. *See* Packin, *supra* note 36, at 212–14.

cerning.[68] Banks are under pressure to manage their capital and liquidity effectively and would prefer to not hold additional capital if they can calculate the exact minimal required capital level, as holding more impacts their profitability and net margins. Yet, the 2008 crisis showed that the Federal Reserve should constantly and carefully assess whether the biggest banks are strong enough to continue lending if the economy plunges into a severe downturn. And we must make sure that the banks understand the importance of this assessment, rather than try to use technology to get as close as possible to evade regulations and frustrate their purpose. Additionally, the biggest corporations, including financial institutions, should not solely rely on RegTech to exactly calculate such critical, critical ratios, just to increase profitability because doing so clearly promotes an unethical business culture.[69]

Similarly, although companies have cybersecurity, financial stability, privacy, corporate governance, and other policies, those typically cover only the bare minimum that the law requires.[70] Indeed, RegTech can be used for both legitimate and illegitimate purposes. Therefore, used in a non-ideal way, businesses can use technology to successfully stick to the regulatory bare minimum or, even when legally possible, promote anti-RegTech. This anti-RegTech phenomenon means basically evading regulation or frustrating regulators' goals and is clearly not increasing ethical behavior at companies. It only pushes businesses and their compliance professionals to foster the very behaviors that regulation was intended to prevent. Moreover, while there is no law against anti-RegTech, there are many ways in which anti-RegTech can breach local law and regulation depending on the circumstances.[71] "It is not enough to have one legitimate purpose if the technology can (and is) being used for regulation-defeating purposes."[72] For example, the recent RegTech trend of financial institutions trying to automatically calculate the exact capital allocations needed to pass governmental agencies' stress tests while maximizing returns is a bit concerning.[73] Banks' profits depend on managing capital and liquidity levels as effectively as possible—they try to avoid holding more capital than required, as

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68. Nizan Packin, *Is RegTech The Answer To Corporate Governance And Risk Management Issues?,* FORBES (Feb. 8, 2019, 2:14 PM), https://www.forbes.com/sites/nizangpackin/2019/02/08/is-regtech-the-answer-to-corporate-governance-and-risk-management-issues/#1d276a78fb49.

69. *Id.*

70. *See, e.g.*, Scott Killingsworth, *Modeling the Message: Communicating Compliance Through Organizational Values and Culture*, 25 GEO. J. LEGAL ETHICS 961, 966 (2012) ("'[C]ommand-and-control' oriented [compliance] programs . . . [provide] [t]he explicit message [that] is the same as the message from law enforcement: follow the rules or pay the penalty.").

71. *See* Packin, *supra* note 36, at 212–14.

72. Jack Nelson, *The Rise of Anti-Regtech?* LEXOLOGY (Apr. 5, 2017),

https://www.lexology.com/library/detail.aspx?g=86320a8b-c385-4c29-b39c-c7dec328ce54.

73. Nathan DiCamillo, *Startups Take on Stress-Testing Tech*, AM. BANKER (Jan. 20, 2019, 9:00 PM), https://www.americanbanker.com/news/startups-take-on-stress-testing-tech?brief=00000161-04ae-d710-ad71-f6beb7c70000.

holding more impacts profitability and net margins—and constantly attempting to find the minimal capital level required.[74] But one of the 2008 financial crisis' lessons was that the Fed must constantly assess if the largest banks are strong enough to be able to lend if the economy takes a major hit. Yet, while the banks understand how critical these assessments are, some still try to use information technology to evade regulations and frustrate this important regulatory goal while still operating in the legal boundaries and being compliant.[75] Thus, the largest financial institutions should not solely rely on RegTech to most accurately calculate any such critical ratios in order to maximize profitability because doing so might pass as legitimate in terms of legal compliance, but nonetheless promotes an unethical business culture.[76]

2. Relaxing RegTech Limiting Principles

This Article focuses on RegTech, which is the management of regulatory processes—in any specific industry—through technology, in the financial services context. Specifically, it zooms in on the financial service providers' regulatory compliance perspective. But, as the RegTech phenomena moves forward, successful dispersal of RegTech innovations from successful deployments in some sectors into various other regulated industry sectors will help decipher what RegTech includes, what should constitute as RegTech, and whether regulatory technologies will truly be transformative.[77]

As can be assumed, entities that have in recent years invested in compliance management systems (CMS's)[78] experience a reduction in the likelihood of noncompliance.[79] The CMS's help address compliance issues in multiple fronts and areas of operations, including finance, environment, health care, workplace

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74. *See* Packin, *supra* note 68.

75. *See* DiCamillo, *supra* note 73 ("With manual processes, it is difficult for banks to create a detailed analysis. Wherever there is ambiguity about data sets, banks will err on the side of conservatism and set aside more capital than is perhaps necessary. . . There is [therefore] a renewed interest in investing in stress-testing technology because banks may have a chance to argue for lower liquidity requirements. . . Stress testing is definitely becoming a focus in regtech.").

76. *See* Packin, *supra* note 68.

77. *See e.g.* Cheng-Yun Tsang, *From Industry Sandbox to Supervisory Control Box: Rethinking the Role of Regulators in the Era of FinTech*, 2019 J.L. TECH.& POL'Y 355–402 (2019), https://ssrn.com/abstract=3420539 (focusing on the financial sector, discussing the fast developments of technology and advocating the use of regulatory and supervisory technology by regulators, and how transformative and useful technology-enhancing initiatives such as industry sandboxes are in effective regulation).

78. *See* FDIC: DIVISION OF DEPOSITOR AND CONSUMER PROTECTION, COMPLIANCE MANAGEMENT SYSTEMS (CMS), https://www.fdic.gov/regulations/resources/director/presentations/cms.pdf (last visited Oct. 19, 2017) (detailing how "[t]he Board of Directors is ultimately responsible for developing and administering a CMS that ensures compliance with federal consumer protection laws and regulations," a move that makes each private company essentially its own regulator).

79. Cary Coglianese & Jennifer Nash, *Compliance Management Systems: Do They Make a Difference?* 34 (Univ. of Pa. Carey Law Sch. Inst. for Law and Econ., Research Paper No. 20-35, 2020), https://ssrn.com/abstract=3598264.

health and safety, and much more.[80] These systems help create organized, all inclusive, checklist-like procedures that help executives upgrade their companies' compliance using government regulation.[81] These systems also enable managers to better identify regulatory compliance liabilities, determine and assign reasonability, monitor progress, and, when needed, intervene, supervise, and even modify things as they see fit.[82] Despite the belief that CMS's help improve enforcement of obligations and lower noncompliance by making more information available to the relevant stakeholders, institute useful internal incentives to better fix noncompliance situations, and generate a compliance culture, evidence shows that CMS's only show modest improvements in risk management.[83] The banks' stress tests example mentioned above illustrates such a situation: despite complying with the capital requirements in the most efficient and accurate way, there would not be much improvement in risk management if banks still try to go above the legally required level as little as technologically possible. A significant difference depends on also instituting demands for appropriate managerial attitudes, changed organizational cultures, and information technologies, which go beyond the CMSs.[84]

II. REGTECH IN THE GOVERNMENT'S SERVICE

This Article focuses on RegTech, reviews key RegTech exemplars for success and failure,[85] and discusses RegTech structures within conventional regulatory methods. It argues that various RegTech methods could help government agencies predict in areas where RegLag is likely to occur and help regulators—who, despite popular belief, are quite effective[86]—minimize RegLag. Shortening lag time is key, especially because regulators suffer from chronic agency

80. *Id*. at 5.

81. *Id*. at 7–8.

82. *Id*. at 5.

83. *Id*. at 34.

84. *Id.* at 5, 34.

85. *See, e.g.*, GAO*, CMS Has Taken Steps to Address Problems, but Needs to Further Implement Systems Development Best Practices* (2015), https://www.gao.gov/assets/670/668834.pdf (demonstrating that government websites have racked up a number of alleged failures, including the failed launch of Healthcare.gov registration); *see also* GAO, *Actions Needed to Enhance Information Security and Privacy Controls* (2016), https://www.gao.gov/assets/680/676003.pdf; Alleged insufficiencies of COVID 19 relief applications at both state and federal levels reinforce the risks of eGovernment rollout failures. *See, e.g.*, Morning Edition, *Small Businesses Say They're Still Waiting For COVID-19 Relief Funds*, NPR (April 9, 2020, 5:02 AM, https://www.npr.org/2020/04/09/830474620/small-businesses-say-theyre-still-waiting-for-covid-19-relief-funds; Ledyard King, *As the Trump Administration Praises Coronavirus Relief Program, Lenders and Small Businesses Criticize Delays*, USA TODAY (Apr. 3, 2020), https://www.usatoday.com/story/money/2020/04/03/coronavirus-program-rescue-small-businesses-beset-delays/2942796001/.

86. *See generally* JOHN M. STEVENS ET AL., BUSINESS-GOVERNMENT RELATIONS AND INTERDEPENDENCE: A MANAGERIAL AND ANALYTIC PERSPECTIVE (Quorum Books, 1988) (demonstrating far less disrespect for regulatory personnel from among private-sector managers than was well represented in common sarcastic derision).

underfunding, which increases their lagging time and results in them as unwilling Luddites in deploying new technology.[87]

The RegTech methods that regulators typically use include:

- Big data collections and analytics.[88]
- Artificial intelligence (AI) and machine learning (ML) based tools.[89]
- Statistical and analytics-informed insights to guide government agencies' enforcement.[90]
- Biometrics and the interpretation of social media.[91]
- The vast proliferation of sensors throughout regulated supply chains.

Regulated entities may deploy similar technologies in their compliance efforts to collect, format, confidentially submit, and publicly disclose real-time or bulk information.[92] RegTech is also expected to require novel forensic techniques beyond the mandatory reporting regime underlying some early RegTech solutions.[93] These RegTech methods, usages, and challenges suggest design elements for this Article's Anticipatory RegTech Model.[94]

A. *Bringing Technologies into the Regulatory Agency Process*

Federal and state efforts to bring technologies into the regulatory agency process have become more noticeable.[95] One such example is deregulation,

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87. *See, e.g.*, Omarova, *supra* note 25, at 77 ("Facing the myriad of pressing demands to fill various immediately salient 'gaps' in the existing legal framework, policymakers often do not have the luxury of taking a step back and reflecting on the bigger issues posed by the spread of new technologies in finance.").

88. *See, e.g.*, Taha Havakhor et al., *Big Data, Retail Investors, and Financial Markets* (March 26, 2020), https://ssrn.com/abstract=3434812 (arguing big data availability increases trading volume).

89. *See, e.g.*, Matt High, *How AI and Machine Learning Are Driving RegTech Innovation*, FinTech Magazine (June 29, 2020), https://www.fintechmagazine.com/venture-capital/how-ai-and-machine-learning-are-driving-regtech-innovation.

90. *See, e.g.*, ANDREW GUTHRIE FERGUSON, THE CAMBRIDGE HANDBOOK OF POLICING IN THE UNITED STATES 492–510 (Tamara Rice Lave & Eric J. Miller eds., Cambridge Univ. Press, 2019).

91. Packin, *supra* note 36.

92. *Bulk Data Repository*, U.S. GOV'T PUBL'G OFF., https://www.govinfo.gov/bulkdata (some data derived from regulated entity disclosures are accessible as "bulk data" through GitHub).

93. *See, e.g.*, HANK C.C HUANG & TABF EDITORIAL BOARD, BASIC KNOWLEDGE ON FINTECH 189 (2020) (e-book).

94. *See, e.g.*, DELOITTE CTR. FOR GOV'T INSIGHTS, GOV'T TRENDS 2020, at 40–45 (2019), https://www2.deloitte.com/content/dam/insights/us/articles/government-trends-2020/DI_Government-Trends-2020.pdf (arguing preemptive regulatory scanning, some deploying AI, could be useful in areas like attenuating crime and human trafficking, preparing for natural disasters, food inspection, hardening cybersecurity by predicting cyberattacks, reducing homelessness, child abuse prevention, and vehicle accident avoidance).

95. The trend of regulators using technology to improve their supervision and regulation has been on the rise in recent years. *See* EY, *How Can Technology Enable Government Agency Transformations?,* GOVT. TECH. (June 16, 2020), https://www.govtech.com/gov-experience/How-can-

which lawmakers push for by encouraging the use of technology in order achieve statutory goals while at the same time reducing the burden of regulation.[96] Such efforts characterize the Carter, Clinton, and Obama Administrations. However, the deregulation waves of the Reagan, Bush (both), and Trump administrations[97] were less about refinement of regulation to maintain goal achievement and more about dismantling regulatory programs to the extent politically possible.[98] In particular, the Trump administration launched a campaign against the Consumer Financial Protection Bureau (CFPB) shortly after the 2016 Presidential elections, largely because of its structure,[99] which Congress especially crafted in 2010 in order to protect the bureau's work and mis-

technology-enable-government-agency-transformations.html ("From AI to RPA, technology is transforming the working world —and government agencies are no exception."); Douglas W. Arner et. al., *Fintech, Regtech, and the Reconceptualization of Financial Regulation*, 37 NW. J. INT'L L. & BUS. 371, 394–97 (2017). In the U.S., much has been said about the adoption of new innovative technologies and their administrability for law enforcement. *See, e.g.*, Emma Raviv, *Homing in: Technology's Place in Fourth Amendment Jurisprudence*, 28 HARV. J.L. & TECH. 593, 594 (2015) ("[T]he Supreme Court has faced and answered difficult questions about technology's role in privacy and criminal procedure . . . [T]he Court . . . [discussed] government agencies using technology . . . ."). But governments' efforts to bring technologies into regulatory agencies are trending all over the world. For example, in Israel, commonly referred to as the Startup Nation, the government has created the Israel Innovation Authority, as it understood long ago the importance of regulating agencies constantly updating their usages of technology in order to conduct their work more effectively and efficiently. *See, e.g.*, ISRAEL INNOVATION AUTHORITY, *Incentive Programs for Innovation with Government Entities*, https://innovationisrael.org.il/en/program/incentive-programs-innovation-government-entities (last visited August 20, 2020) ("[c]ollaboration between the Innovation Authority and the various government ministries enables to focus government effort in selected fields, including. . . supplementary support of regulatory entities with the regulatory requirements for pilot tests, access to government-owned trial sites and facilities, significant impact on the growth of Israeli companies, and the creation of market influence from technological application in further levels of the local innovation ecosystem.").

96. *See, e.g.*, Rob Nicholls, *How to Use Regulatory Technology to Get Deregulation Right*, UNSW BUSINESS SCHOOL: BUSINESS THINK (July 7, 2020), https://www.businessthink.unsw.edu.au/articles/regulatory-technology-deregulation.

97. *See generally* Jonathan S. Masur & Eric A. Posner, *Chevronizing Around Cost-Benefit Analysis: Deregulation in the Trump Administration*, DUKE L.J. (forthcoming 2021), *available at* https://ssrn.com/abstract=3538456 (discussing the Trump administration's efforts to weaken regulations).

98. *See, e.g.,* BARRY D. FRIEDMAN, REGULATION IN THE REGAN-BUSH ERA: THE ERUPTION OF PRESIDENTIAL INFLUENCE (Univ. Pitt Press 1995); Rachel Augustine Potter, *The Trump Administration's Regulatory Corner-Cutting Isn't Just Bad For Democracy—It's A Bad Strategy*, BROOKINGS INST. (Nov. 20, 2018), https://www.brookings.edu/research/the-trump-administrations-regulatory-corner-cutting-isnt-just-bad-for-democracy-its-a-bad-strategy/; Patricia A. McCoy, *Inside Job: The Assault on the Structure of the Consumer Financial Protection Bureau*, 103 MINN. L. REV. 2543 (2019) (describing how after the Trump Administration took power, the new leadership declared outright war on the Consumer Financial Protection Bureau (CFPB) and tried to de-regulate much of the issues the Bureau has focused its power on).

99. Commentators criticized the CFPB's unique structure, which was the subject of the Supreme Court's holding in *Seila Law LLC v. CFPB,* 140 S. Ct. 2183 (2020), as further explained below.

sion from narrow political interests.[100] The campaign against the CFPB continued with the appointment of a new Acting Director, who halted the implementation of specific regulation and slowed down regulatory enforcement efforts.[101] Finally, the deregulation attempts included seeking a Supreme Court's holding on the CFPB's structure and scope of work.[102] Specifically, *Seila Law LLC v. CFPB* zoomed in on the CFPB's single leader's independent tenure protections, which attempted to enable the agency to better protect consumers, but allegedly gave too much power to the agency's director.[103] Agreeing with the CFPB's opponents' structure argument, on June 29, 2020, the Supreme Court held that the leadership structure was unconstitutional.[104] Therefore, in the longer term, *Seila*'s biggest effect will probably be that every elected president likely appoints a new CFPB director, similarly to the appointment of new Cabinet members.[105]

The CFPB deregulation campaign supports a developing argument that a strong form of presidency is emerging, which diminishes traditional checks and balances.[106] This Presidentialism is characterized by suppression of agency statutory mission when the presidential administration seeks "sub rosa" deregu-

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100. *See* McCoy, *supra* note 98, at 2545 ("Once the Trump Administration took power, the new leadership and industry declared outright war on the Bureau. The assault came from all sides: from the Republican-controlled Congress, from the new Administration, and from the courts. Interestingly, the target was not so much the substance of federal consumer financial laws as the structure of the CFPB itself. The attack on structure was based on the premise that the CFPB's effectiveness was largely a product of its structure and that undermining that structure was essential to neutering the Bureau.")

101. *See* Leonard Kennedy et al., *The Consumer Financial Protection Bureau: Financial Regulation for the 21st Century*, 98 CORNELL L. REV. 1141, 1146–49 (2012) (describing the powers Congress bestowed on the CFPB).

102. John Kruzel & Harper Neidig, *The 7 Most Anticipated Supreme Court Decisions*, THE HILL (June 7, 2020), https://thehill.com/regulation/court-battles/501437-the-7-most-anticipated-supreme-court-decisions.

103. *See* Richard Cordray, *Why the CFPB's Loss at The Supreme Court is Really a Win*, WASH. POST (June 29, 2020), https://www.washingtonpost.com/opinions/2020/06/29/why-cfpbs-loss-supreme-court-is-really-win/.

104. *Id.* But, despite that holding, seven of the nine justices left untouched all other aspects of the agency's operations, with Chief Justice Roberts commenting that "the CFPB's structure and duties remain fully operative without the offending tenure restriction."

105. Nizan Geslevich Packin, *Show Me the (Data About) the Money!,*5 UTAH L. REV. 1277, 1292 (2020).

106. *See, e.g.,* Joshua Galperin, *The Death of Administrative Democracy*, 82 PITT. L. REV. 1(2020) (arguing judicial expansion of presidential powers, an ascendant Presidentialism, re-creates majoritarianism with the electorate indirectly controlling the administrative state through majority election of the president); Julian Mortenson & Nicholas Bagley, *Delegation at the Founding* (Univ. of Michigan L. Sch. Pub. L. Research Paper No. 658, 2021), https://ssrn.com/abstract=3512154 (arguing recent resurrection of non-delegation, severely limiting independence of regulatory agency rulemaking discretion from presidential policy dictates, is inconsistent with the Founders' intent); Andrew Coan, *Eight Futures of the Nondelegation Doctrine* (Arizona Legal Studies Discussion Paper No. 20-01), https://ssrn.com/abstract=3516976.

lation.[107] Predictably, some Libertarians view it as just the opposite: liberal presidential administrations seek to aggressively expand agency authority beyond the confines of their statutory missions, such as when re-regulation is the presidential goal.[108] Presidential administration suppression of regulatory agency information collection, consideration of opposing argument and open deliberation worsens this collapse of the independent administrative state.[109] In such environments, RegTech advancements can probably follow two paths—either RegTech becomes less effective, or it remains the only viable regulatory method to achieve agency statutory goals.

1. Electronic Government Underpinnings

Since RegTech flourishes most using AI and immediate access to data, proper legislation must orient the information foundations of government-inspired RegTech. The Paperwork Reduction Act of 1980[110] is a great example of such a statute, as it controls the manner and purposes for which regulatory programs require recordkeeping and disclosure by regulated entities. Amended in 1995,[111] the Act centralizes coordination in the Office of Management and Budget (OMB), requires the ubiquitous OMB approval manifest as "control numbers," and establishes the Office of Information and Regulatory Affairs (OIRA) as the central clearinghouse for federal forms. Federal agencies must justify regulations that impose recordkeeping and disclosure requirements with objectives, planning and testing the uses envisioned for the information, estimating the burden created, and ensuring "quality, objectivity, utility, and integrity of information."[112]

Similarly, the eGovernment Act of 2002,[113] including its imbedded Federal Information Security Modernization Act (FISMA) and amendments enacted as "FISMA reform" in the Federal Information Security Modernization Act of 2014[114] further empower the National Institute of Standards and Technology (NIST) to set cybersecurity standards that impact RegTech at all federal agen-

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107. Matthew J. Steilen, *Presidential Whim*, (Univ. of Buffalo Sch. of L. Studies Research Paper No. 2019-015), https://ssrn.com/abstract=3557903 (arguing for legislation to enforce presidential decision-making to be based on values like faith, faithfulness, responsibility, honesty, due care, and professionalism and less on "presidential whim").

108. *See, e.g., David Boaz, For This Libertarian, Obama's First Year Looks Grim*, NAT'L PUB. RADIO (Jan.20, 2010), https://www.npr.org/templates/story/story.php?storyId=122762284.

109. *See, e.g.,* Robert L. Glicksman, *Shuttered Government*, 62 ARIZ. L. REV. 575, 634 (2020) (arguing RegTech information access initiatives at regulatory agencies suffering reversals).

110. Paperwork Reduction Act of 1980, 44 U.S.C. §§ 3501–3521.

111. *Id.*

112. Information Quality Act, 44 U.S.C. §§ 3501–3516 (2000).

113. E-Government Act of 2002, 44 U.S.C. § 101.

114. Federal Information Security Modernization Act of 2014, 44 U.S.C. § 3551.

cies.[115] Indeed, even Presidential administrations, which have adopted different approaches regarding the ideal intensity of regulation, opined on cyber security of regulatory agency information systems as well as on regulated entities.[116] Particularly as the personally identifiable information (PII) aspects of affected parties' privacy is concerned, federal and state governments[117] have an increasingly stringent position on how well regulatory methods provide information security.

The U.S. government has made many RegTech advances by making agency data holdings both standardized and accessible, impacting FOIA responsibilities. The amount of Federal data produced, collected, and retained is extraordinary and presidential initiatives lie at the heart of this information bonanza. In 2005, George W. Bush's Exec. Order No. 13,392[118] required strategic FOIA planning, encouraged FOIA requests, encouraged data access on agency websites, and required FOIA officer designation. FOIA compliance oversight is delegated to the Attorney General and OMB. President Obama's Exec. Order No.13,642 created a comprehensive federal open data policy and this inspired statutory reaffirmation of open data under the OPEN Act.[119] Under the OPEN Act, government data should be complete, timely, accessible to the widest range of users, configured in machine-readable formats, non-discriminatory, non-proprietary and license free.[120] Government sources of regulated entity data can inform confirmation of regulator effectiveness, regulatory program efficacy and regulated entity compliance success.

Sponsored research grantors increasingly mandate that data developed in the funded research be made available broadly. While enabling replication of research as validation, it represents a RegTech disclosure requirement. Under National Science Foundation (NSF) rules:

> Investigators are expected to share with other researchers, at no more than incremental cost and within a reasonable time, the primary data, samples, physical collections and other supporting materials created or gathered in the course of work

115. DoD cybersecurity is generally a superset of NIST standards as control over weapons systems carries higher potential costs than many other regulatory program foci.

116. *See* Exec. Order No. 13636, 3 C.F.R. § 217 (2014); *see also* Exec.Order No. 13873, 3 C.F.R. § 317 (2020).

117. *See* Privacy Act of 1974, 5 U.S.C. § 552a. *See also* Gramm-Leach-Bliley Act of 1999, 15 U.S.C. §§ 6801–6809; Children's Online Privacy Protection Act of 1998, 15 U.S.C. §§ 6501–6506; California Consumer Privacy Act of 2018, Cal. Civ. Code §§ 1798.100-1798.199; Health Insurance Portability and Accountability Act of 1996, 42 U.S.C. §1320d.

118. Exec. Order No. 13392, 3 C.F.R. § 217 (2006).

119. Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. No. 115-435, §§ 201–202, 132 Stat. 5529, 5534–44 (2019).

120. *See, e.g.,* Austin Klawitter, *New Law Could Make US Government Data Much More Useful*, THE GLOBE POST (Feb. 14, 2019), https://theglobepost.com/2019/02/14/open-government-data/.

under NSF grants. Grantees are expected to encourage and facilitate such sharing.[121]

The Foundations for Evidence-Based Policymaking Act of 2018[122] makes a stronger policy mandate for open sharing of sponsored research that supports curricular development. Additional rulemakings impact federally funded research, very positively impacting accessibility of data developed in federally sponsored research. The OMB Open Data Memorandum (OMB M-13-13)[123] and Project Open Data and the Foundations for Evidence-based Policymaking Memorandum (OMB M-19-23)[124] make NSF and other agencies responsible to maintain data inventories of all data resources.

Lastly, many governments' constructed databases receive "value-added" enhancements by the private sector. For example, weather information is collected, standardized, and organized by the National Weather Service. These data are successfully repackaged[125] by print and broadcast media.[126] Global positioning system (GPS) data has unleashed cartographic, geographic, wayfinding/routing, precision farming, battlefield navigation, location of services, supporting equipment and control, and many other modern travel conveniences.[127] Integration[128] of disparate domains of data from local, state, and na-

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121. *See, e.g., Proposal and Award Policies and Procedures Guide, Ch. XI: Other Post Award Requirements and Considerations, D. Intellectural Property, 4. Dissemination and Sharing of Research Results, sec. b.*, THE NAT'L SCI. FOUND. (Feb. 25, 2019), https://www.nsf.gov/pubs/policydocs/pappg19_1/nsf19_1.pdf.

122. Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. No. 115, 435, 132 Stat. 5529.

123. *See* Memorandum from Sylvia M. Burwell, Dir. of the Off. of Mgmt. & Budget, Exec. Off. of the President et al., to the Heads of Executive Departments and Agencies (May 9, 2013), https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2013/m-13-13.pdf.

124. *See* Memorandum from Russell T. Vought, Acting Dir. of the Off. of Mgmt. & Budget, Exec. Off. of the President, to the Heads of Executive Departments and Agencies (July 10, 2019), https://www.whitehouse.gov/wp-content/uploads/2019/07/M-19-23.pdf.

125. *See, e.g.,* Nat'l Weather Serv., NOAA, Value of a Weather-Ready Nation (2011), https://www.performance.noaa.gov/wp-content/uploads/PPI-Weather-Econ-Stats-10-13-11.pdf.

126. PA Senator Rick Santorum was sole sponsor of the National Weather Service Duties Act of 2005 (NWSDA), S.786, 109th Cong. (2005). The sponsor's introductory statement/remarks on April 14, 2005 make clear that the legislation was inspired by a belief that private sector firms using value-added business models, in some industries, have the "right to expect these [federal administrative] agencies to minimize unnecessary, competitive, and commercial-type activities, not be subjected to competition with government agencies," *see* 151 CONG.REC. S.3658 (2005). But, opposition to the privatization of theretofore public open source information, when essential to safety, is arguably detrimental to the public interest, *see, Air Traffic Services Brief—National Weather Service Duties Act of 2005—Santorum Bill S. 786*, AOPA (Apr. 28, 2005, 10:08 A.M.), https://www.aopa.org/advocacy/advocacy-briefs/air-traffic-services-brief-national-weather-service-duties-act-of-2005-santorum-bill-s-786.

127. Phillip Yam, *How to Kick-Start Innovation with Free Data*, SCI. AM. (March 23, 2013), https://www.scientificamerican.com/article/how-to-kick-start-innovaton/.

128. Enterprise architecture is a sub-field of information science that integrates data by facilitating communication and data interchange among people, machines and computers, *see, e.g.,* F.B. VERNADAT, ENTERPRISE MODELING AND INTEGRATION: PRINCIPLES AND APPLICATIONS (Chapman

tional governmental repositories can be combined to produce other impressive services, such as real estate valuations in Zillow.[129]

III. A REGULATORY LAG THEORY (REGLAG)

Regulatory policy deployment has followed general patterns similar to the development of both the common law and statutory enactment. The basic pattern begins with (i) some human need or inspiration that, (ii) arouses ingenuity or activity, (iii) that allegedly causes harm, (iv) eventually some of these activities become notorious, (v) that contributes to building sufficient will among a constituency endowed with political power or legal authority, leading to, (vi) debate over policy changes that finally, (vii) results in enactment of policy change. The common law relies on judge and jury determinations that become habitual as precedent. The forces of public policy exert influence on legislative enactment. Agency research, as well as lobbying from regulated entities and affected parties, channel regulators' choices in decision-making on policy, investigations, and enforcement (de)emphasis.

All these lawmaking routes involve delay. For example, computer hacking occurred for decades before relevant legislation was enacted and enforced. In the 1980's individuals that manipulated telecommunication systems were typically not prosecuted. Such individuals, referred to as phreakers,[130] used software in order to get calling card numbers and create basic tone devices that enables them to place phone calls for free. Likewise, a sub-category of phreakers, which were more sophisticated and skilled in information systems conducted more advanced phreaking activities. However, since there were no laws and no governmental agencies with the needed expertise, hardly any hackers were prosecuted until Operation Sundevil.[131] Thus, there was a long delay between the time the first phreaks started operating in the early 1970's and the mid-

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& Hall, London, 1st ed.1996); Enterprise Integration Act of 2002, Pub. L. No. 107–277, 116 Stat. 1936, 1938 (Nov. 5, 2002) (codified at 15 U.S.C. § 278g) (defining "enterprise integration" as " the electronic linkage of manufacturers, assemblers, suppliers, and customers").

129. Vivek Kundra, *Digital Fuel of the 21st Century: Innovation through Open Data and the Network Effect*, Joan Shorenstein Ctr. on the Press, Pol. and Pub. Pol'y Discussion Paper Series #D-70, Jan. 2012, at 1,16.

130. Phreakers are defined as "someone who likes to play with the phone system." *See* Kenneth Rosenblatt, HIGH-TECHNOLOGY CRIME: INVESTIGATING CASES INVOLVING COMPUTERS 126 (1995). Phreakers are experts in using telephone devices and systems for their own, free, use. Via equipment like blue boxes, Phreakers make global toll-free calls. Frequently, Phreakers use or sell stolen credit card numbers or telephone account numbers. *Id.*

131. Alexander Urbelis, *Toward A More Equitable Prosecution of Cybercrime: Concerning Hackers, Criminals, and the National Security*, 29 VT. L. REV. 975, 977 (2005) ("On May 8, 1990, the most sweeping computer-crime crackdown to date occurred, unprecedented in scope and publicity. It was known as Operation Sundevil. The investigation was not directed towards intrusions of federal-interest computers, national security, or other such lofty state interests. Rather, Operation Sundevil sought to combat the 'traditional scourges of the [then] digital underground: credit card theft and telephone code abuse.'").

1980's, which is when the Computer Fraud and Abuse Act & Computer Security Act of 1987 were passed.[132] Another notable example of a delay in regulation can be found in connection with privacy rights. While several scholars realized the importance of privacy in the past,[133] it is only in the 2000's that priprivacy has become a topic of wide discussion.[134] Yet despite the clear need for regulation concerning privacy rights and consumer protection, such regulation in the U.S. is very much delayed.[135]

This lag in lawmaking is not surprising.[136] The common law does not have the agility to keep pace with increasingly fast changes in culture, society, and especially in technology and innovation,[137] partially because it was not historically designed to keep up with the modern evolution of technology.[138] The result is a typical regulatory lag between modern era social changes or cultural norms and the capability of regulating them efficiently in general, and in particular when the changes are the result of innovation or technology.[139] Additionally, some lawmaking delay is based in libertarian resistance to external control. Human actors imagine transparency will trigger unwelcome responses. Stealth human activity is often disguised as benign behavior. Tradition often justifies tolerating static customary institutions. Rational analysis of economic effects and the consequences of the human condition take time to assess. Contributions from academic researchers may lag because faculty still have their day jobs. Delay is a habitual response leading to slow change while change is often staunchly resisted.[140] Regulator agility is chronically delayed. As the Supreme

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132. Computer Fraud and Abuse Law of 1984, Pub. L. No. 98-473, 98 Stat. 2190 (1984) (codified at 18 U.S.C. § 1030 (Supp. III 1985)), amended by Pub. L. No. 99-474, 100 Stat. 1213 (1986) (codified at 18 U.S.C. § 1030 (Supp. V 1987)).

133. *See, e.g.,* Samuel D. Warren & Louis Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193 (1890).

134. *See, e.g.*, Daniel J. Solove, *A Taxonomy of Privacy*, 154(3) U. PENN. L. REV. 477 (2006); Ira Rubinstein & Nathan Good, *Privacy by Design: A Counterfactual Analysis of Google and Facebook Privacy Incidents,* 28 BERKELEY TECH. L. J. 1333 (2013).

135. Currently, most of the federal laws around privacy rights date back to the 1960's, 1970's, 1980's and 1990's—times in which the internet was not as nearly developed. *See, e.g.,* Freedom of Information Act, 5 U.S.C. § 552 (1966); Family Educational Rights and Privacy Act, 20 U.S.C. § 1232g (1974); Privacy Act, Pub. L. No.93–579 (1974); Electronic Communications Privacy Act, Pub. L. No. 99-508 (1986); Driver's Privacy Protection Act, 18 U.S.C. § 1721(1994); Health Insurance Portability and Accountability Act, Pub. L. No. 104–191 (1996); and Financial Services Modernization Act (Gramm-Leach-Bliley Act), Pub. L. 106–102(1999).

136. *See supra* note 8.

137. *See* Lyria Bennett Moses, *Recurring Dilemmas: The Law's Race to Keep Up with Technological Change*, 2007 U. ILL. J.L. TECH. & POL'Y 239 (2007) (*demonstrating* how law lags behind innovation and technology advancements).

138. Carla L. Reyes, *Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal*, 61 VILL. L. REV. 191, 202 (2016).

139. *See supra* note 8, as "law lag" or "legal lag" are terms that were frequently used in law and technology literature.

140. *See, e.g.,* Rob Frieden, *Regulatory Arbitrage Strategies and Tactics in Telecommunications,* 5 N.C. J. L. & TECH. 227, 271 (2004) (stating that "[t]oo many regulatory asymmetries remain

Court explained in *Verizon Communications Inc. v. FCC,* a regulatory lag is a delay between a change in certain market conditions, production technologies, or innovations, and the modification and updating of laws that are founded on those factors.[141]

This Article focuses on the delay that takes place from the first appearance of a regulable activity and until effective regulation is initiated as RegLag, a term similar to the 'law lag' concept, but more inclusive.[142] This Article argues, however, that RegTech, and in particular, technology-enabled anticipatory approaches, can help reduce RegLag, which is considered a source of regulatory inefficiency,[143] by modifying the types of regulable activities.

RegLag can offer private actors incentives that take one of two forms: the possibility to earn more profits, or the threat of reduced earnings or losses, if the

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in place even though the public policy justifications no longer make sense. Regulatory lag or inertia accounts for some of the delay, but it also appears that stakeholders, particularly beneficiaries of regulatory asymmetries, successfully argue against change.").

141. *See* Verizon Comms. Inc., et al. v. Fed. Comms. Comm'n et al., 535 U.S. 467, 505–506, 560 (2002).

142. 'Law lag' or 'legal lag' are phrases that have been used in law and technology literature in connection with situations in which "existing legal provisions are inadequate to deal with a social, cultural or commercial context created by rapid advances in information and communication technology." *See* Jeremy Pitt & Ada Diaconescu, The Algorithmic Governance of Common-Pool Resources, in FROM BITCOIN TO BURNING MAN AND BEYOND: THE QUEST FOR IDENTITY AND AUTONOMY IN A DIGITAL SOCIETY 130, 137–38 (John H. Clippinger & David Bollier eds., 2014); Carla L. Reyes, *Moving Beyond Bitcoin to an Endogenous Theory of Decentralized Ledger Technology Regulation: An Initial Proposal*, 61 VILL. L. REV. 191, 202 (2016) (explaining law lag in the context of distributed ledger technology and its regulation); Thomas R. McLean, *The Offshoring of American Medicine: Scope, Economic Issues and Legal Liabilities*, 14 ANNALS HEALTH L. 205, 254 (2005) (discussing things that tend to limit the legal lag time associated with telemedicine technology and usages); Michael L. Rustad & Thomas H. Koenig, *Cybertorts and Legal Lag: An Empirical Analysis*, 13 S. CAL. INTERDISC. L.J. 77, 77–78 (2003) (showcasing how Richard Nixon, in 1936, reflected on how within one generation, automobile liability law became so developed that the size of a comprehensive review grew from a few-page document to an entire encyclopedia); Michael L. Rustad & Maria Vittoria Onufrio, *The Exportability of the Principles of Software: Lost in Translation*, 2 HASTINGS SCI. & TECH. L.J. 25, 29 (2010) (demonstrating how "[i]n the case of software law, there has been a forty-year 'legal lag' between the rises of software as a separate industry and the development of specialized contracting principles."). Somewhat relatedly, discussing how and theorizing which norms will shape the future of public administration, the solution-driven Silicon Valley technologies, or the culture of justification of public law jurists. *See also* Paul Daly, *Artificial Administration: Administrative Law in the Age of Machines* 1, 2 (Ottawa Faculty of Law, Working Paper No. 2020-03, 2019), https://ssrn.com/abstract=349338. In this Article we focus on "RegTech," which is similar to 'law lag,' or 'legal lag', but broader as does not specifically refer to circumstances in which the lag results from technologically-driven changes, but generally to situations in which new regulation is needed to address new types of "wrongs" or new should-be-regulable types of activities. 'Law lag' or 'legal lag' in that sense, are terms that closely follow the understanding that "[l]aw lags science; it does not lead it." *See, e.g., Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316, 319 (7th Cir. 1996); *Sanderson v. Int'l Flavors & Fragrances, Inc.*, 950 F. Supp. 981, 1003 (C.D. Cal. 1996).

143. *See* Pitt & Diaconescu, *id*.

regulators adjust the prices downward.[144] Therefore, RegLag is typically the result of active gaming by potentially regulated entities to intentionally avoid, skirt or frustrate regulation; especially given the notoriously slow administrative rule-making processes, which result in a lag[145] as "agile private actors" adjust to the rules and avoid sanctions when the administration does eventually update its regulation. Therefore, the pace of economic change makes regulatory effectiveness become decreasingly feasible with increased RegLag.[146] But, this Article argues that technology can assist in reducing RegLag, making markets more efficient and responsive to change by accurately imbedding new data into supply, demand, volume and market clearance prices. Technology has also propelled markets to higher transaction velocity, sometimes instantaneous clearance, growing transaction volumes particularly when adjusted per capita, and may be the most important contributor to increased variety in goods and services. Arguably, regulator inspired RegTech has driven much efficiency in financial markets.

Still, technology-induced progress and refinement in regulation remain relatively under-utilized resources. Regulators are chronically behind-the-curve in deploying information, computer and tele-communications technologies. Furthermore, whatever countermeasures were formerly effective to channel undesirable or prohibited activities eventually become obsolete. Also, business practice innovation complicates the short useful life of regulatory control mechanisms. Regulated entities often target the circumvention of existing regulatory measures, which enable such private actors to outmaneuver regulators.[147] Thus, the business practice discovery and countermeasure development are a cat and a mouse cycle that many regulatory agencies should acknowledge to inform development of effective countermeasures.[148]

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144. Kurt A. Strasser, *Bonus and Penalty Plans to Improve Public Utility Performance: Lessons from the Cases*, 19 CONN. L. REV. 513, 521 (1987).

145. Kristin N. Johnson, *Things Fall Apart: Regulating the Credit Default Swap Commons*, 82 U. COLO. L. REV. 167, 240–41 (2011).

146. The term RegLag is conventional empathy with rate regulated industries, e.g., public utilities. RegLag is the hypothetical loss produced by episodic rate-making proceedings. Regulated entities are locked-in to rates of return determined at periodic proceedings then become unable to maintain the awarded "fair rate of return" during periods of cost inflation (e.g., energy, labor, financing). *See, e.g.*, Thompson, H.E. and Thatcher, L.W., *Required Rate of Return for Equity Capital Under Conditions of Growth and Consideration of Regulatory Lag*, 49 LAND ECON. (1973). In this paper, regulatory lag is similar but broader. The delay in regulatory responsiveness is broader and not tied solely to the fixed periodic reconsideration regulated pricing (rates) but extends to regulator delay in all its activities.

147. David Skeel, THE NEW FINANCIAL DEAL: UNDERSTANDING THE DODD-FRANK ACT AND ITS (UNINTENDED) CONSEQUENCES 157 (2011).

148. *See, e.g.,* Jason Tashea, *Cat-and-mouse game: Customers demand cybersecurity, law enforcement wants easier access to evidence*, AM. BAR J. (Oct.1, 2018) https://www.abajournal.com /magazine/article/cybersecurity_law_enforcement_access (*arguing* technological advances responsive to customer privacy demand frustrates law enforcement investigatory tools); *see also* CLARENCE CHIO AND DAVID FREEMAN, MACHINE LEARNING AND SECURITY: PROTECTING SYSTEMS WITH DATA AND ALGORITHMS (2018); Danny McPherson, *Cybercrime–A game of cat and*

As applied to FinTech, this Article argues that RegLag occurs when innovations in business practices develop and deploy long before regulators can afford investigation or develop useful understanding. RegLag delays compromise effective counter-measure development. Innovation in government activities is narrowly directed, even when it behaves at its most robust. There are far fewer actively funded, encouraged and rewarded regulatory agency efforts, particularly when compared with investment in the broader array of private sectors.[149]

Nevertheless, technology is double-edged: while it shows promise to reduce RegLag, technology also creates friction that can increase RegLag delays. Most technical innovations in the private sector cause RegLag as evidenced by delayed and reactionary public policy response from frictions in: (i) phenomena discovery, (ii) theorizing, (iii) development and interpretation of control mechanism alternatives, (iv) assessment of control mechanism efficacy, and (v) deployment of these regulatory mechanisms to adjust rights, duties and opportunities. A great example for this is blockchain regulation, which has externalities that "are destined to experience regulatory lag. Nevertheless, it remains possible that this lag can be reduced as regulators and policymakers expend resources and creative intelligence to better understand, address, and resolve blockchain characteristics."[150]

1. Regulatory Arbitrage Contributes to RegLag

RegLag also suffers from the regulatory arbitrage phenomenon.[151] When economic actors perceive strict control looms large in one market or for one transactional configuration, there is a natural tendency to reconfigure their activity in some other form that avoids classification in a regulated form.[152] There

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mouse in 2009, 2 NETWORK SECURITY 15–18 (2010); Aron Laszka et al., *A survey of interdependent information security games*, 47 ACM COMP. SURVEYS 1–38 (2014), https://dl.acm.org/doi/pdf/10.1145/2635673.

149. Public goods are most likely to attract financial support in government-inspired innovation programs, including government funded research. *See, e.g.,* Joshua R. Bruce, & John M. de Figueiredo, *Innovation in the U.S. Government*, Duke L. Sch. Pub. L. & Legal Theory Series No. 2020-30 (2020) (reviewing federally funded research and development including resulting patenting activity; arguing federal funding concentrates in technological, organizational, regulatory, and policy realms, noting a majority of the 200,000 federal government scientists work at DoD, DoE and NASA in physical science and engineering; and that other agencies' patented innovation is heavily weighted toward mathematics, social sciences, and data analytics).

150. John W. Bagby et. al., *An Emerging Political Economy of the Blockchain: Enhancing Regulatory Opportunities*, 88 UMKC L. REV. 419, 474 (2019).

151. *See, e.g*., Elizabeth Pollman, *Regulatory Arbitrage, and Limits*, 20 EUR. BUS. ORG. L. REV. 567 (2019) (discussing the phenomenon of regulatory arbitrage); Annelise Riles, *Managing Regulatory Arbitrage: A Conflict of Laws Approach*, 47 CORNELL INT'L L. J. 63 (2014).

152. Regulatory arbitrage exists as a side effect in many disciplines under various names, including balloon effect and regulatory displacement. The balloon metaphor is vividly obvious, seen when gas escapes from a balloon's flattened zone (regulated zone) of a gas-filled balloon spreads in other directions to displace to other parts of the balloon. This dramatic image illustrates the general concept of a substitution effect that recognizes that barriers imposed to certain activities leave only

is a substitution effect when scarcity impacts markets for one type of good or service. Increases in (regulatory compliance) costs for one product or service configuration induces producers to supply unregulated substitutes. Producers and consumers explore alternative products or services that serve similar purposes. Measures of economic utility are explored that ostensibly approximate satisfaction of product or service features. As regulation is seen to constrain some form of activity, demand (or supply) migrates to these substitutes.

RegLag materializes from those who intentionally configure their activity to create alternative designs, at least in part, to avoid regulation. When a novel and currently unregulated transaction, product or service structure is deployed, it inhibits regulatory response. Regulators can suffer jurisdiction confusion and can be ham-strung by narrow, legacy definitions of regulable activities. Further, well-organized regulated industry groups regularly exert influence to encourage hands-off restraint: directly on regulators and indirectly through regulators' watchdogs—judicial review, legislative oversight and funding and policy influence from the executive branch.

Financial market regulation may be the paradigm of regulatory arbitrage and its contribution to RegLag. Consider the exemplar of CFTC vs. SEC jurisdiction over derivatives: there are powerful constituents (both regulated entities and affected parties) under each agency, these two quasi-independent agencies are generally disincentivized towards coordination, and financial innovation occurs world-wide incentivizing evasion of national or sectoral regulation.[153] Similarly, consider the exemplar of the regulatory arbitrage that exploits the "loophole" associated with the industrial loan corporations (ILCs)—state level chartered depository institutions that are not regulated as banks, but still have access to federal deposit insurance under the FDIC.[154]

(sometimes) less desirable alternatives, nevertheless economic actors migrate to the next, most effortless course of action. The balloon effect is controversial in policy analysis of drug enforcement, *see generally*, Betsy Marsh, *Going to Extremes. The U.S.-Funded Aerial Eradication Program in Colombia*, Report, The Latin America Working Group Education Fund, Washington DC (March 2004) at 8 (arguing balloon effect accurately describes eradication of drug cultivation as a form of displacement); *but c.f.*, Cornelius Friesendorf, *Squeezing the Balloon, United States Air Interdiction and the Restructuring of the Southern American Drug Industry in the 1990s*, 44 Crime, L.& Soc. Crime 35–78 at 36, 39, 40, 52 (2005) (arguing the balloon effect metaphor could be misleading as a mono-causal model of displacement), accessible at: https://link.springer.com/content/pdf/10.1007/s10611-006-9005-9.pdf. *See also*, Phillips, Richard, *Sophisticated Financial Engineering and Tax Arbitrage*, Combating Fiscal Fraud and Empowering Regulators at 36, 325, accessible at: https://library.oapen.org/bitstream/handle/20.500.12657/47105/9780198854722.pdf.

153. *See, e.g.,* Edward J. Kane, *Regulatory Structure in Futures Markets: Jurisdictional Competition Between the SEC, the CFTC, and Other Agencies*, 4 J. FUTURES MKTS. 367 (1984); John D. Benson, *Ending the Turf Wars: Support for a CFTC/SEC Consolidation*, 36 VILL. L. REV. 1175 (1991); Timothy G. Massad, *It's Time to Strengthen the Regulation of Crypto-Assets* 29–33 (Brookings Inst., Working Paper, 2019) https://www.brookings.edu/wp-content/uploads/2019/03/Timothy-Massad-Its-Time-to-Strengthen-the-Regulation-of-Crypto-Assets-2.pdf.

154. Marc Hochstein, *A Quick Guide to What's at Stake in The Sofi Charter Controversy*, AM. BANKER. (July 25, 2017), https://www.americanbanker.com/slideshow/a-quick-guide-to-whats-at-stake-in-the-sofi-charter-controversy.

Coordinated response among competing regulators may serve as a possible countermeasure to regulatory arbitrage, although this may become less effective as regulated entities cheat. Of course, a federal solution can blunt regulatory arbitrage. Central governments can address non-uniformity among provincial governments; this is particularly effective when the regulable activity impacts multiple regions. International regulatory cooperation is a weak form of federalization that can minimize such spillover.

IV. A SOLUTION TO REGLAG: ANTICIPATORY REGTECH MODEL

RegTech compliance deployments generally accumulate piecemeal. Some RegTech systems are quickly retired or are decommissioned if they fail (mostly) unspecified effectiveness standards imposed by the deploying regulated entities.[155] It is unclear whether the work of independent auditors sampling and testing, or confirmation of public disclosure accuracy inform anyone inside or outside regulated entities on the efficacy of RegTech compliance methods. Regulated entities' deployments of RegTech in their compliance systems are not uniformly disclosed to regulators nor in mandatory financial disclosures.[156] Predictions based on selective samples,[157] like that presented here, may provide the best initial analysis useful in developing an anticipatory model to divine

155. RegTech efficacy testing is only indirectly imposed by regulatory agencies. For example, investigations and enforcement against non-compliance is an indirect validation method for compliance RegTech. As enforcement experience grows at regulatory agencies, piecemeal standards could develop.

156. Some reporting companies may discuss their RegTech compliance efforts in their quarterly and annual reports, in IPO documents (prospectus) when issuing new securities, in proxy solicitation information statements, in offering disclosures required for various exempt offerings, or in the "white papers" typical to initial coin offerings (ICO). When independent audits are required, auditors would likely be required to verify these disclosures if/when encountered. However, RegTech costs or savings may fail the materiality disclosure threshold, undermining both disclosure and review. Furthermore, the trend in SEC reporting for non-financial matters in Regulation S-K is to "de-dupe" certain details and simplify compliance, *see, e.g.,* SECH. EXCH. COMM'N., *Release No. 10750: Management's Discussion and Analysis, Selected Financial Data, and Supplementary Financial Information* (Jan. 30, 2020), https://www.sec.gov/rules/proposed/2020/33-10750.pdf (proposing to remove and reserve two Regulation S-K disclosure requirements, Item 301, 17 C.F.R. § 229.301 and Item 302, 17 C.F.R. § 229.302 as well as simplifying Item 303, Management Discussion and Analysis (MD&A)), 17 C.F.R.§ 229.303); SEC. EXCH. COMM'N., *Release No. 10668: Modernization of Regulation S-K Items 101, 103, and 105* (Aug. 8, 2019), https://www.sec.gov/rules/proposed/2019/33-10668.pdf (proposing changes in several descriptive items of issuer business operations and legal proceedings). The MD&A is a logical home for any narrative discussion of RegTech initiatives or its performance. Furthermore, the Reg. S-K Item 103 Legal Proceedings might be another location for this discussion. Both locations are limited by materiality and litigation disclosure is generally episodic while compliance is continuous.

157. *See, e.g.,* English, Stacey & Susannah Hammond, *Fintech, Regtech and the Role of Compliance*, THOMSON REUTERS (Jan. 17, 2018) https://legal.thomsonreuters.com/content/dam/ewp-m/documents/legal/en/pdf/reports/fintech-regtech-and-the-role-of-compliance-2017.pdf (reporting survey results on RegTech by regulated entities).

RegTech needs, deployments and success.[158] Many of these data are proprietary and likely to remain confidential unless voluntarily disclosed or mandatory disclosures emerge under requirements of some regulatory program deeming RegTech compliance transparency essential. That day has not yet arrived. Indeed, regulated entities that believe their RegTech compliance efforts constitute competitive advantage are the least likely groups to forthrightly reveal such matters. After all, there is no reason to share what could constitute trade secrets, unless there is a legal requirement to do so or it is otherwise believed that disclosure holds some strategic advantage.[159] Likewise, as to the RegTech deployments, data on costs, effectiveness analysis, and generalizability to other regulatory programs, is poorly retained or studied, which makes developing successful anticipatory models more challenging.

Our legal system must mandate and help enable better transparency such that RegTech progress is accelerated and diffused. Nevertheless, regulatory agency deployments of RegTech constitute a voluminous record such that any complete catalog remains currently infeasible.[160]

A. *Addressing the Technology Diffusion Lag–Equalizing the Playing Field*

Innovative RegTech systems, as promising as they may be, can take very long to prove useful once deployed, or show up in productivity statistics.[161] Part of the reason for that is "technology diffusion lag"—a delay between the time a new technology is introduced and how long it takes for it to become widely adopted.[162] It can take a long time for a new technology or innovative system to be successfully deployed and replace an existing one.[163] And while many sectors such as health care, education, energy, and public safety suffer

158. *See, e.g.,* GOVERNMENT TRENDS 2020, Center for Government Insight, Deloitte Consulting (2020), https://www2.deloitte.com/content/dam/insights/us/articles/government-trends-2020/DI_Government-Trends-2020.pdf (arguing that potentially regulable problems can be preempted with predictive analytics that anticipate business practices).

159. Of course, vendors of RegTech compliance systems diminish any such competitive advantage when off-the-shelf compliance systems are marketed to large swaths of regulated entities on a non-discriminatory basis. Nevertheless, a competitive advantage might be perceived when RegTech "solutions" are either developed in-house or purpose-built by independent service organizations (ISO) under contracts restricting vendor resale to other clients. In these latter two cases, RegTech compliance "solutions" could constitute protectable IP, *see, e.g.,* Chrysler Corp. v. Brown, 441 U.S. 281 (1979) (holding disclosed information was not confidential in reverse-FOIA case).

160. *See* Bagby & Reitter, *Anticipatory FinTech Regulation, supra* note 33 (chronicling historical accretion of FinTech innovations by regulators and SROs, the regulator RegTech innovations).

161. FED. COMMC'N COMM'N, *Connecting America: The Nat'l Broadband Plan*, 2010 WL 972375, at *176 (Mar. 16, 2010).

162. "The final stage of the cycle is diffusion—the technology's widespread adoption." Gaia Bernstein, *In the Shadow of Innovation*, 31 CARDOZO L. REV. 2257, 2272 (2010).

163. For more on this, *see* Rody E. Manuelli & Ananth Seshadri, *Frictionless Technology Diffusion: The Case of Tractors* (April 2003 NBER Working Paper No. w9604), https://ssrn.com/abstract=392991.

more from technology diffusion lags—particularly because our twenty first century economy is moving from analog to digital—the public sector is especially behind in adapting its systems to take advantage of the information technology era.[164] Regulators and government agencies suffer much more from the technology diffusion lag than private industry players.[165]

To improve regulatory agency clairvoyance and enable regulators to develop successful anticipatory RegTech models, the playing field must be levelled and equalized. This can be done if regulators focus on addressing the following issues. First, regulators must be willing to pay the upfront costs of replacing and updating their technological infrastructure to successfully attract and hire young and talented employees that are qualified to compete with current private sector computing standards.[166] Second, regulators cannot involve themselves as participants in the information and data collection and sharing wars that take place in the private sector. Therefore, the government can and should drive innovation in the private sector like it has in the past,[167] but must figure out how to feed data back into its system and improve its standard protocol for onboarding new technology. Likewise, regulating agencies must improve the protocols regarding getting services of outside contractors,[168] including not necessarily rehiring contractors who did not adhere to standards in the past, even if it means not working just with "experienced" contractors.[169] Slow bureaucratic processes and the preference for massive purchases also typify the disconnect between the federal government and the private sector.[170] For instance, the U.S. Citizenship and Immigration Services (USCIS) dedicated years to update its systems

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164. *Id*.

165. Jack Corrigan, *The Government's Struggle to Hire Young Tech Talent is Worse Than You Thought*, NextGov, (Dec. 1, 2017), at https://www.nextgov.com/cio-briefing/2017/12/governments-struggle-hire-young-tech-talent-worse-you-thought/144225/.

166. *Id.* (explaining that according to the U.S. Office of Personnel Management's federal workforce data, in 2017, for every IT employee under 30 years old, there were 4.5 over 60).

167. *See* Rana Foroohar, *Why You Can Thank the Government for Your iPhone*, TIME (Oct. 27, 2015, 2:11 PM), https://time.com/4089171/mariana-mazzucato/.

168. For some discussion on what this entails see Rick Douglas Humphress, *The Contractor Shadow Government: A Literature Review* (April 7, 2018), https://ssrn.com/abstract=3268125 (reviewing the role of private contractors in conducting America's public business); Charles Tiefer, *Restrain "Risky Business": Treat High-Risk Private Security Contractors as Inherently Governmental*, 50 HARV. J. LEGIS. 209 (2013).

169. For instance, even though Oracle was not successful in launching HealthCare.gov in 2013, it still received from the federal government millions of federal dollars per year after that happened. *See, e.g.,* Han Schank & Sara Hudson, *Hawaii's false alert shows the sorry state of government technology*, WASH. POST (Jan. 19, 2018, 1:03 PM), https://www.washingtonpost.com/outlook/hawaiis-false-alert-shows-the-sorry-state-of-government-technology/2018/01/19/59486fa2-fbcb-11e7-a46b-a3614530bd87_story.html.

170. For an example of this, *see* Jared Serbu, *Why DoD May Have Given Amazon Every Reason To Protest JEDI,* FED. NEWS NETWORK (Dec. 18, 2019, 9:06 AM), https://federalnewsnetwork.com/defense-main/2019/12/why-dod-may-have-given-amazon-every-reason-to-protest-jedi/ (discussing, inter alia, the slow DoD procurement process that can drag on for years, and how the deployment of critical technology is thus delayed).

and digitize its immigration forms, and by the time the new platforms was launched, it was already outdated.[171] Third, the gap between the technological abilities of regulators and those of the private sector is likely to widen unless efforts such as the initiation of the Modernizing Government Technology Act of 2017 (MGT Act)[172] continue, and enable the government to move towards more easily adopting technologies and improving cybersecurity measures.[173]

1. The Black Box Problem

Even if cultural and business obstacles can be overcome, regulatory failure to completely understand how certain technologies work or calculate results—as some RegTech tools operate in a "black box" like fashion—may present difficulties.[174] Specifically, AI, machine learning, and predictive analytics are tools that involve complex applications of data science on massive amounts of sometimes random data sets, frequently in dynamic ways. Since it would be almost impossible for regulators to understand and even audit some RegTech tools or results, they might be reluctant to adopt such RegTech anticipatory tools or deploy them for regulatory purposes, like when dealing with internal models for risk-weighting or stress testing.[175] For regulators to get comfortable

171. *See* Schank & Hudson, *supra* note 169.

172. H.R. 2227, 115th Cong. (2017). *See* H.R. REP NO. 115-129, pt. 1, at 10 (2017) ("[The MGT Act] is intended to build on FITARA and empower and hold accountable covered agency [chief information officers] to pursue IT modernization."). The MGT Act was meant to create new budget accounts to fund efforts to modernize regulators' IT systems. *Id*. at 1–2. The need to modernize technology and make it more cost effective while also improving its ability to protect information security was raised many times in congressional hearings. *See, e.g.*, *Federal Agencies' Reliance on Outdated and Unsupported Information Technology: A Ticking Time Bomb: Hearing Before the H. Comm. on Oversight & Gov't Reform*, 114th Cong. 1 (2016). Similarly, State Representatives specifically stated how regulators' budget cuts minimize the funds that government agencies get to spend on system upgrades, hiring, and talent retention that are key to the regulators' ability to update outdated information systems. *Id*. at 4.

173. *See* OFF. OF MGMT. & BUDGET, EXEC. OFF. OF THE PRESIDENT, OMB M-18-12, IMPLEMENTATION OF THE MODERNIZING GOVERNMENT TECHNOLOGY ACT (2018), https://www.whitehouse.gov/wp-content/uploads/2017/11/M-18-12.pdf.

174. Nizan Geslevich Packin, *Consumer Finance and AI: The Death of Second Opinions?*, 22 N.Y.U. J. LEGIS. & PUB. POL'Y. 319, 357–58 (2020) (explaining that "[m]achine-learning algorithms are known for being extremely accurate, but this precision comes with an interpretive cost, which is the reason such algorithms have been referred to as 'black box' systems. . . Machine-learning algorithms turn a series of inputs to a series of outputs by perfecting a performance criterion, however, that is the maximum that analysts are capable of understanding in terms of the algorithms actions. Algorithmic users are not truly able to tell which particular relationships between variables factor into the algorithm's categorization, or at which stage. Similarly, algorithmic users also cannot 'establish how exactly the algorithm puts together different associations to yield its categorizations.' Hence, the 'black box' metaphor . . . .").

175. *See* INST. OF INT'L FIN., REGTECH IN FINANCIAL SERVICES: TECHNOLOGY SOLUTIONS FOR COMPLIANCE AND REPORTING 1 (2016).

with these tools, they will need to be confident that the models do what they are "supposed" to do, and that outputs can be trusted.[176]

As mentioned above, this Article seeks to enable better transparency such that RegTech progress is accelerated and diffused. To do that we must equalize the technology diffusion lag playing field between the private and the public sector, and help regulators be able to enjoy the possible benefits of anticipatory technology.

2. Anticipating RegTech Deployment at Regulatory Agencies

Despite the opacity and slowness of RegTech developments at regulatory agencies or the opaqueness of RegTech developments at regulated entities, some clairvoyance seems possible. Research can develop inventories of RegTech information from various sources. For example, regulatory agencies charged with developing regulatory effectiveness expertise and comparative analytics among a broad range of regulatory programs are obvious sources. The Office of Management and Budget (OMB) and its constituent unit, the Office of Information and Regulatory Affairs (OIRA) already conduct coordination among non-independent agencies (cabinet level), critique cost-benefit analysis of major rules[177] and coordinate each agency's policy conformance with Executive branch policy directives.[178] Retrospective confirmation of existing rule efficacy also supplies additional RegTech effectiveness information.[179]

Regulatory agency plans to mechanize regulatory program elements are likely evident on their records. Few government agencies experience much wild growth or prosperous times as was once believed they did, such as during the New Deal. Agency budgets and authorities are targeted for reduction by libertarians, foes of big government and budget conscious policy advocates. Therefore, it may be challenging for agency personnel advocating RegTech to win cost-benefit arguments for such investments.

B. *Anticipatory RegTech in Financial Services Regulation*

Consider the financial services industry. There are numerous regulatory agencies both deploying RegTech innovations or confronting compliance RegTech "solutions" from regulated entities. Overcoming the cost-benefit case against such public expenditure may require the development of big data con-

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176. Jonah M.A. Crane, *RegTech: Bending the Risk/Cost Curve or Breaking It?*, 20 No. 4 FINTECH L. REP. NL 2, 5 (2017).

177. *See* Exec. Order No. 12,291, 3 C.F.R. § 127 (1981); John Watson Bagby, *Regulatory Impact Analyses: Towards a Reasonable Economic Impact from Federal Regulations,* 19 NEW ENG. L. REV. 533–550 (1984).

178. *See* Exec. Order No. 12,498, 3 C.F.R. § 323 (1985).

179. *See* Exec. Order No. 13,610, 77 Fed. Reg. 18,467 (May 14, 2012).

sortia, inter-state coordination,[180] specialization by particular agencies, and data sharing among many if not all regulatory authorities.[181] First, in the U.S. there are fifty state banking regulators, fifty state blue sky securities regulators, fifty state attorneys general (AG), the Commodity Futures Trading Commission (CFTC), the Treasury Department's Financial Crimes Enforcement Network (FinCEN), the Securities and Exchange Commission (SEC), the Comptroller of the Currency, the Federal Deposit Insurance Corporation (FDIC), and the National Credit Union Administration (NCUA), among others. Second, there are additional suppliers, users and hosts of such data including non-governmental entities like the various self-regulatory organizations (SRO), the trading platforms and exchanges, Financial Industry Regulatory Authority (FINRA), state bar associations and accounting regulators and societies. State regulation of money service/transmitter businesses (MSB) is not uniformly overseen by each state's bank regulators and is sometimes the domain of other state agencies.[182] Third, international regulators add additional layers of non-standardization or cooperation but may also impose data sharing and enforcement barriers. Given the RegTech leadership that Europe and some Asian nations have displayed,[183] the move toward a more uniform approach that minimizes regulatory arbitrage might better attain regulatory objectives while controlling costs.[184]

C. *SEC's FinHub Anticipatory RegTech*

Since 2018, the Strategic Hub for Innovation and Financial Technology (FinHub) has inspired a forecasting of RegTech at the SEC. FinHub provides a

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180. *See generally*, CONF. OF STATE BANK SUPERVISORS & MONEY TRANSMITTERS REGUL. ASS'N, THE STATE OF STATE MONEY SERVICES BUSINESSES REGULATION & SUPERVISION 1 (2016) (exemplifying inter-state coordination).

181. National Association of States' Attorneys General (NAAG) share data, coordinate multi-state investigations and enforcement and share analysis.

182. *See generally Interactive Map of US State Financial Regulators*, FAISALKHAN.COM (Nov. 11, 2020), https://faisalkhan.com/services/money-transfer-license-money-transmitter-license/us-money-transmitter-license/list-of-money-services-businesses-msb-license-regulators/.

183. *See* Dirk A. Zetzsche et al., *Fintech Toolkit: Smart Regulatory and Market Approaches to Financial Technology Innovation* (Univ. of H.K. Research Paper No. 2020/027, 2020) (advocating seven principles of FinTech regulatory approaches).

184. An important factor regarding regulatory expectations is the need for consistency of approach across borders. Multiple memoranda of understanding have been agreed upon by regulators, while organization like the Global Financial Innovation Network (GFIN) have been established to facilitate the engagement among companies and regulators and establish a framework for partnership and cooperation among the different regulators themselves. GLOBAL FINANCIAL INNOVATION NETWORK, GFIN – ONE YEAR ON 10 (2019) ("As the pace of technological change increases it requires regulators to adapt to a new landscape and devise new ways of working together. There are still many areas to look at and in many ways our work is just beginning. We expect future challenges to include understanding and working with data privacy and data-sharing requirements across many jurisdictions and regulators.").

portal for the FinTech activities conducted by various SEC divisions and offices[185] as:

> "[A] central point of focus for our efforts to monitor and engage on innovations in the securities markets that hold promise, but which also require a flexible, prompt regulatory response."[186]

FinHub engages in forecasting the emergence and potential regulation of blockchain/distributed ledger, cryptocurrencies, automated investment tools ad robo-advisers, digital marketplace financing (e.g., crowdfunding), and artificial intelligence/machine learning. One RegTech example targeting ICO applies the longstanding *Howey* framework to ICO in the SEC's *Framework for 'Investment Contract' Analysis of Digital Assets*.[187]

Big data must play an increasing RegTech role because AI deployment requires large data sets to reason, link or make discoveries using pattern analysis. AI deployment is increasingly noted throughout government and across regulatory programs.[188] There is very extensive AI use in the intelligence community (IC). AI-enabled automated detection in enforcement[189] depends on big data.[190] The National Market System's Consolidated Audit Trail (CAT - NMS) is a comprehensive data reporting and retention system of all reportable events to be electronically filed by SROs with the central repository, the Securities Industry Automation Corporation (SIAC), a NYSE Euronext subsidiary. The CAT-NMS should allow regulators to track all activity efficiently and accurately throughout U.S. markets trading National Market System (NMS) securities. These activities include identity of members associated with all quote and order related instances, such as origination, modification, cancellation, routing, and execution.

Additional SEC anticipatory RegTech efforts include various activities of the SECs Distributed Ledger Technology Working Group, the SECs Center for Risk and Quantitative Analytics, the xBRL disclosure submission standardization effort, and a "sources sought" RFP announcement seeking the provision of

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185. Press Release, Sec. & Exch. Comm'n, SEC Launches New Strategic Hub for Innovation and Financial Technology (Oct. 18, 2018).

186. *Id*.

187. SEC. & EXCH. COMM'N, FRAMEWORK FOR "INVESTMENT CONTRACT" ANALYSIS OF DIGITAL ASSETS 1 (2019).

188. *See, e.g.*, DAVID FREEDMAN ENGSTROM ET AL., GOVERNMENT BY ALGORITHM: ARTIFICIAL INTELLIGENCE IN FEDERAL ADMINISTRATIVE AGENCIES (2020); *see also* DAVID FREEDMAN ENGSTROM ET AL., APPENDIX—GOVERNMENT BY ALGORITHM: ARTIFICIAL INTELLIGENCE IN FEDERAL ADMINISTRATIVE AGENCIES (2020) (documenting data underlying report on AI use at various regulatory agencies).

189. Jerry Arnold, *Automated Detection in SEC Enforcement*, HARVARD LAW SCHOOL FORUM ON CORPORATE GOVERNANCE (May 31, 2014), https://corpgov.law.harvard.edu/2014/05/31/automated-detection-in-sec-enforcement/.

190. *See* Scott W. Bauguess, Acting Dir. and Acting Chief Economist, Div. of Econ. And Risk Analysis, The Role of Big Data, Machine Learning, and AI in Assessing Risks: a Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai.

data for the "most widely used" blockchain ledgers based on transaction volume, in order to "monitor risk and improve compliance" related to cryptocurrencies.[191] The SEC will require data in an "easily reviewable" format, along with an overview of how the information is extracted and converted to ensure "there is no loss in data completeness and accuracy due to the data transformation tools and processes applied." Notably, the SEC is seeking to identify transaction details among "the universe of available information." The SEC also seeks to deploy a Plain English approach to cryptocurrencies and BlockChain language given a general misunderstanding of the varying esoterica used in ICO white papers and related documents.[192] The SEC is undertaking anticipatory RegTech regulatory approaches consistent with the anticipatory model recommended here.

1. Federal Reserve Anticipatory RegTech Experience

The Federal Reserve System is actively involved in collecting economic data, formatting it in standard ways to inform the Federal Reserve Board (Board) for its decision-making. Such data underlie working papers, notes, data compilations, international finance discussion papers, and several other categories of published data and analysis by the Board's staff and by member regional Federal Reserve Banks. These cover many financial system topics driving the Fed's anticipation of regulable activities from innovation in the banking industry. These include the payment system, currencies, monetary policies, consumer protection needs, financial system stability, supervision and general regulation of financial institutions.

There is some specialization in regional Federal Reserve Bank publications; these member banks are owned by member commercial banks so research that informs RegTech and big data are financed off-the-books of the federal government. For example, forecasting crypto regulatory arbitrage adaptations to avoid regulation is inextricably tied to anti-money laundering (AML) enforcement, among the most enduring of RegTech applications. The COVID-19 pandemic accelerates electronic payment demand.[193] However, most cryptocurrencies remain unlikely to meet that demand because crypto generally behaves like highly volatile commodities, sometimes perhaps as securities, thereby missing the mark as stable currencies.[194]

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191. Blockchain Data, SEC Sources Sought No. 50310219Q0041 (Jan, 31, 2019), http://www.fbodaily.com/archive/2019/02-February/02-Feb-2019/FBO-05208153.htm.

192. *See* SEC. & EXCH. COMM'N, FRAMEWORK FOR "INVESTMENT CONTRACT" ANALYSIS OF DIGITAL ASSETS (April 3, 2019) https://www.sec.gov/corpfin/framework-investment-contract-analysis-digital-assets.

193. *See, e.g.*, Juergen Braunstein, Marion Laboure & Sachin Silva, *COVID-19 Pandemic Accelerates the Rise of Digital Payments*, THE ECONOMIST: PERSPECTIVES (Mar. 20, 2020), https://www.sec.gov/corpfin/framework-investment-contract-analysis-digital-assets.

194. *See generally* Bagby et al., *An Emerging Political Economy, supra* note 150, at 452–53 (arguing many, if not most ICO, constitute an initial offering of securities under the *Howey* defini-

2. CFPB's Anticipatory RegTech

The CFPB was greatly scrutinized in 2020 by the U.S. Supreme Court. It has been actively involved in recent years in collecting financial data and formatting it in standard ways to inform its different divisions for their decision-making and consumer protection efforts. In fact, according to the bureau's published *Strategic Plan, Budget, And Performance Plan and Reports,* the bureau has been "committed to staying on the leading edge of technology and leveraging its technological resources to provide significant business value with lower costs. From developing online products that help inform consumers to making critical data available internally and to the public, technology is and will continue to be core to the CFPB accomplishing its mission."[195] Specifically, the CFPB has stated that it seeks to "[e]nhance the successful deployment of projects through the continued use of disciplined methodologies . . . and facilitate the development of the long-term technology strategy that guides future mission capabilities."[196] Similarly, the CFPB has declared that it will "[c]ontinue to build and develop a data-driven strategy that is deployed on a technology architecture with scalable capabilities that will allow the Bureau to use and manage data in order to conduct predictive analytics and aid in decision making."[197] Lastly, it explained that it will continue to strengthen its ability "to design, develop, implement, and maintain new tools with enhanced capabilities, features, and functionalities for a variety of business applications that support the Bureau's mission."[198]

Additionally, in 2020, the CFPB has launched Tech Sprints,[199] an idea that the bureau borrowed from Financial Conduct Authority (FCA) in the U.K.[200] The Tech Sprints operate with the goal of bringing together "technologists with financial, consumer, and regulatory stakeholders for short, intense problem-solving sessions."[201] By launching the Tech Sprints, the CFPB aims to "[d]evelop actionable technology-focused solutions to a variety of regulatory

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tion of an investment contract and promoters and their affiliates engage in unlawful acts preceding or during an ICO distribution).

195. *See, e.g.*, CONSUMER FIN. PROT. BUREAU, THE CFPB STRATEGIC PLAN, BUDGET, AND PERFORMANCE PLAN AND REPORT 6, 77 (Feb. 2016), https://files.consumerfinance.gov/f/201602_cfpb_report_strategic-plan-budget-and-performance-plan_FY2016.pdf (in the document the CFPB states that one of its goals is to "[e]nable the innovative use of technology for the benefit of efficient internal processes and effective public engagement.").

196. *Id*. at 4–85.

197. *Id*.

198. *Id*.

199. *Electronic Disclosures of Adverse Action Virtual Tech Sprint*, CONSUMER FIN. PROT. BUREAU, https://www.consumerfinance.gov/policy-compliance/innovation/cfpb-tech-sprints/electronic-disclosures-tech-sprint/ (last visited Feb. 17, 2021).

200. Steven Harras, *CFPB Proposes 'Tech Sprint' Competitions To Foster Fintech Innovation*, CQ ROLL CALL WASH. BANKING BRIEFING, Sept. 18, 2019, 2019 WL 4460412.

201. *Innovation at the Bureau*, CONSUMER FIN. PROT. BUREAU, https://www.consumerfinance.gov/policy-compliance/innovation/ (last visited Feb. 17, 2021).

and consumer protection challenges; [h]arness technology to reduce burden, improve results, and create greater efficiencies across financial markets; and [e]xplore how technology can reshape compliance and speed effective interaction between regulators and financial institutions."[202] Specifically, the CFPB "plans to design innovative electronic methods" for addressing some of its goals, which are reflected in laws such as the Equal Credit Opportunity Act (ECOA) and/or the Fair Credit Reporting Act (FCRA), improving the accuracy of information used to take adverse action, and ever more importantly, anticipating discrimination on a prohibited basis and trying to better prevent it.[203]

3. RegTech Anticipates Market Manipulation

Balance is an elusive goal among various market influences. Atomized, redundant, separate, and poorly-linked markets that trade similar or complementary goods and services, may retain some independence from each other despite their similarity. One benefit of such market isolation includes their autonomy from gyrations imposed by other markets. However, they suffer risk that their isolation deprives them of useful influences from markets trading similar assets. Gyrations sound harmful while useful influences often seem important, particularly if accurate signals spell efficiency from whatever source those signals emanate. Separated, independent markets probably serve mostly the interests that dominate each. Strong inter-market linkages likely connect all markets with a larger, louder, seemingly legitimate "guiding-hand," thereby, representing the wisdom of bigger crowds. However, as globalization continues, advancements in the speed and spread of market influences, perhaps the ultimate achievement of a long overdue National Market System,[204] suggest the isolation from autonomous parallel markets will continue to decline. Increasingly, this phenomenon is becoming evident in how market manipulation can be spread globally among markets. RegTech may be the silver-bullet sufficient to counter manipulation-induced negative externalities.

Manipulation in markets for almost anything, currencies, commodities, financial instruments, corporate control, and even the political marketplaces for ideas, likely share characteristics and intrusive mechanisms. RegTech can reveal trading patterns, identify manipulative scheme participants, isolate manipulated venues (markets, platforms) and thereby inform regulatory enforcement with circumstantial evidence that "leads" further enforcement inquiry. Second to providing leads, the RegTech "twins" of big data and AI are likely to provide

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202. *Id*.

203. *Electronic Disclosures of Adverse Action Virtual Tech Sprint*, *supra* note 199.

204. Securities Act Amendments of 1975, Pub. L. No. 94–29, 89 Stat. 97; Regulation NMS, 70 Fed. Reg. 124, 37496 (June 29, 2005); James L. Hamilton, *Marketplace Organization and Marketability: NASDAQ, the Stock Exchange, and the National Market System*, 33 J. FIN. 487 (1978); Norman S. Poser, *Restructuring the Stock Markets: A Critical Look at the SEC's National Market System*, 56 N.Y.U. L. REV. 883 (1981); Jonathan R. Macey & David D. Haddock, *Shirking at the SEC: The Failure of the National Market System,*1985 U. ILL. L. REV. 315 (1985).

the basis for circumstantial evidence derived from inference, both statistical and causal.[205] With some regulatory changes, disclosure enhancements, cyberspace security refinement and forensic watermarking, RegTech might even provide sources of direct evidence of manipulative intent and action.[206]

a. *The Nature of Market Manipulation*

Manipulation is unlawful under various theories: civil regulatory, tort-like private right of action and a criminal. Manipulation is mostly prohibited under the federal securities, commodities, and banking laws.[207] Provisionally, consider manipulation as acts intended to influence bid and ask postings, transaction closing prices, trading volumes and generally impact the general appearance of supply and demand. This can extend to the markets for registered or unregistered securities, but also impacts commodities, currencies, and conceivably should extend to the market for services or the political marketplace for ideas.[208] Of course, collusion among co-conspirators to set prices, constrain supply or otherwise manipulate markets is also an antitrust violation.[209] Efforts to make political manipulation illegal are regularly and robustly suppressed by the very political forces habitually benefiting therefrom.[210]

Securities market experience with manipulation during the Roaring Twenties perhaps made this market's manipulation a primary target for suppression under the New Deal's various Federal Securities Laws.[211] Market integrity, the quality of embedding the wisdom of crowds who are motivated by their own "skin in the game," is undermined by manipulation that compromises free-market forces of supply and demand. Manipulation misleads or defrauds when intentional, by setting, stabilizing, raising or lowering price, as well as by false-

205. *See, e.g.,* Beate Franke et al., *Statistical Inference, Learning and Models in Big Data*, 84 INT'L STAT. REV. 371 (2016).

206. *See, e.g.,* MATTHEW LIPPMAN, CRIMINAL EVIDENCE (1st ed. 2016) (distinguishing criminal prosecutorial use of circumstantial evidence as inferential, mediated by judges and weighted by juries from direct evidence resulting from observation).

207. *See, e.g.,* Employment of Manipulative and Deceptive Devices, 17 C.F.R. § 240.10b-5 (1951); 15 U.S.C. § 78i (2010).

208. *See generally,* Eric Posner, *The Law, Economics, and Psychology of Manipulation*, COASE-SANDOR WORKING PAPER SERIES L. AND ECON. No.726 (2015) (citing Sunsteins provisional definition as "controlling or playing upon someone by artful, unfair, or insidious means especially to one's own advantage" noting the narrow policing yet broad generalization, well beyond market interference to include psychological manipulation, contractual manipulation). *See also* Cass R. Sunstein, *Fifty Shades of Manipulation,*1 J. MARKETING BEHAV. 213 (2016).

209. *See generally* Shaun D. Ledgerwood, James A. Keyte, Jeremy A. Verlinda, & Guy Ben-Ishai, *The Intersection of Market Manipulation Law And Monopolization Under The Sherman Act: Does It Make Economic Sense?* 40 ENERGY L.J. 47 (2019) (comparing antitrust with Commodities Futures Trading Commission (CFTC) regulation of commodities manipulation).

210. *See generally* Citizens United v. FEC, 558 U.S. 310 (2010).

211. *See generally* Frederick G. Kempin Jr., Jeremy L. Wiesen & John W. Bagby, LEGAL ASPECTS OF THE MANAGEMENT PROCESS 816–20 (4th ed. 1990); Adolph A. Berle, *Stock Market Manipulation*, 38 COLUM. L. REV. 393 (1938).

ly communicating unmet, over-estimating or under-estimating, supply or demand.

Manipulation is often perpetrated using a complex scheme not unlike money-laundering,[212] that disorients and exhausts detection efforts,[213] particularly when composed of one or more transactions without economic substance.[214] A simple form of manipulation is a large, single trade that appears to boost supply or demand. A series of trades at rising or falling prices erects a façade of market movement favoring (successive up pricing is bull raiding) or disfavoring (successive down prices is bear raiding) the targeted asset. Appearances can be enhanced using additional trading in derivatives or options in the underlying asset because derivative markets link to underlying asset market conditions. There can be further false appearance of corroboration from well-timed rumors or news items, signaling innocent investors that they should imitate trading strategies. A useful illustration of such a well-timed rumors is Elon Musk' tweeting about bitcoin and cryptocurrencies, which influenced many individuals and business to immediately invest in those as well.[215] Another salient example of this is how social media and stock platforms allegedly assisted manipulative trading in the GameStop/RobinHood controversy in late January 2021.[216] Pending the results of investigations by researchers, the media, and law enforcers as to what happened in the GameStop/RobinHood case, criminal conspiracy could very well be one explanation. Indeed, when well-coordinated, collusions may

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212. *See generally,* John W. Bagby, *Protecting Critical Infrastructure through Effective Money Laundering Enforcement*, 8 CIP RPT. 6 (2010) (explaining that manipulation and money-laundering share the features of complexity - a convoluted series of transactions that raise the costs of detection and enforcement because some components have the appearance of legitimate economic substance).

213. *See generally,* Merritt B. Fox, Lawrence R. Glosten & Gabriel V. Rauterberg, *Stock Market Manipulation and its Regulation*. 35 YALE J. REG. 67 (2018) (providing an analytical framework for securities market manipulation).

214. *See generally,* Barbara C. George & John W. Bagby, New Directions in the Architecture of Bribery: Expanded Prosecutions Under the Foreign Corrupt Practices Act Intertwined with a Money Laundering Component (Manuscript #84) (Aug.13, 2011) (on file with the Academy of Legal Studies in Business).

215. *See, e.g.,* Micah Maidenberg, *On Twitter, Elon Musk Has Mused About Bitcoin*, WALL ST. J. (Feb. 8, 2021, 4:51 PM), https://www.wsj.com/articles/on-twitter-elon-musk-has-mused-about-bitcoin-11612821103 (discussing Elon Musk's months long tweets and Tesla's decision to buy bitcoin, and quoting Michael Saylor, founder and chief executive of a publicly traded company that has invested in bitcoin, explaining that "[i]f you want to do your shareholders a $100 billion favor, convert the [Tesla] balance sheet from [U.S. dollars to bitcoin]. Other firms on the S&P 500 would follow your lead & in time it would grow to become a $1 trillion favor.").

216. *See, e.g.,* Jason Zweig, *The Real Force Driving the GameStop Revolution*, WALL ST. J. (Jan. 30, 2021, 12:01 AM), https://www.wsj.com/articles/the-real-force-driving-the-gamestop-amc-blackberry-revolution-11611965586 (explaining how "[t]housands of members of WallStreetBets, a forum at the online community reddit.com, have been leading the swarm of amateur individual traders buying stocks that hedge funds and other institutional investors were betting against . . . [while] thousands of small traders took to social media simultaneously to express outrage, demand redress and exhort each other to "HOLD THE LINE," by not selling their shares.").

constitute criminal conspiracies. The quantum of damages rises as the larger sections of the targeted market takes its cues from these deceptive signals.

Larger scale manipulative schemes may deploy matched orders—the near simultaneous purchase and sale of similar size positions at near identical prices. These are also known as "wash" sales because the risk of market losses is mostly cancelled out, or washed clean, except for transactions costs.[217] Of course, certain legal hedging transactions use arbitrage that can resemble fictitious orders.[218] "Marking the close" are trades made above or below the last reported transaction, right at the cessation of trading, giving an overnight illusion of impending price movement at the next market opening.[219]

Additional schemes include front-running, stabilization, hot issues and cornering. The latter has been a common commodities manipulative scheme in which the manipulator seeks control over much of the deliverable supply or demand. The concept of squeezing the shorts recognizes that some sellers do not own what they have sold, intending to acquire the deliverable quantity later at lower prices in a falling market they expect will result.[220] Corners manipulate supply forcing shorts to cover their positions at much inflated prices. Links between markets regulated by different regulatory agencies, such as links between the SEC regulated stock market and the CFTC regulated commodities markets (derivatives, indices, futures) take advantage of regulatory arbitrage, a lack of enforcement coordination among regulators responsible for different trenches of financial services.[221]

b. *Could RegTech VIX an Emerging Manipulation Problem?*

Market manipulation in financial assets generally depends on fundamentals, the conditions impacting that asset's market prospects. For example, one's understanding of a publicly traded firm's stock or bond market performance generally depends on the market for that firm's products and services as well as on

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217. *See generally*, Serkan Imisiker & Bedri Kamil Onur Tas, *Wash Trades as a Stock Market Manipulation Tool*, 20 J. BEHAV. & EXPERIMENTAL FIN. 92, 92–98 (2018).

218. *See, e.g.,* Franklin Allen, Lubomir Litov & Jianping Mei, *Large Investors, Price Manipulation, and Limits to Arbitrage: An Anatomy of Market Corners*

10 REV. FIN. 645, 645–693 (2006).

219. Of course, after-hours trading and 24/7 trading platforms attenuate this manipulative device's effectiveness somewhat.

220. As was demonstrated in the GameStop/RobinHood controversy, the SEC has insufficient manipulation enforcement tools. *See generally* Thomas Franck, *'You've Got To Have A Cop On The Beat': Elizabeth Warren Slams SEC Over Gamestop Chaos*, CNBC (Jan. 28 2021, 3:36 PM), https://www.cnbc.com/2021/01/28/elizabeth-warren-gamestop-robinhood-market-manipulation.html ("Sen. Elizabeth Warren lambasted the Securities and Exchange Commission . . . . 'We need an SEC that has clear rules about market manipulation and then has the backbone to get in and enforce those rules,' Warren said."). This Article's RegTech predictive regulation model might be useful in better addressing such RegLag issues.

221. *See, e.g.,* Annelise Riles, *Managing Regulatory Arbitrage: A Conflict of Laws Approach*, 47 CORNELL INT'L L.J. 63 (2014).

the firm's competitive environment in those product or service markets. "Manipulability" of commodities has additional complexity because there can be additional layers that complicate commodities market manipulation.[222] Regulator monitoring of social media (SM) is one source of early warning system leads about manipulation.[223] Moreover, SM monitoring by regulators can provide circumstantial evidence and investigatory leads to uncover manipulatory schemes. For example, in January 2021, day traders created "short squeezes" by arguably taking on and confronting hedge funds that were allegedly engaging in active shorting. Additionally, some of the shorts allegedly pressured market intermediaries to attenuate the day traders' bull riding of several failing stocks.[224] However, to accomplish comprehensive, real-time, all-transaction surveillance, regulators must access instantaneous, direct feeds. Furthermore, off-exchange trading must not be in high enough volumes nor receive immediate, high-visibility transaction reporting.[225] Additionally, the taking of the market's pulse to determine attitudes of traders can enhance a RegTech approach to supplying big data to AI algorithms[226] that identify trading anomalies closely associated with known and evolving patterns of market manipulation.[227]

VIX is the ticker symbol for an index with no underlying asset that represents a measurement of volatility, a condition over which analysts and traders continually seek greater understanding. VIX is the popular name for the Chicago Board Options Exchange's CBOE Volatility Index, probably the most popular measure of volatility. The VIX is based on the volatility of S&P 500 index options.[228] A whistleblower alleged that large traders exploited a flaw in the calculation of the VIX, effectively manipulating the VIX when they posted fictitious transaction quotes. An antitrust class action was filed in the Northern

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222. *See, e.g.,* Neal Rasmussen, *From Precision Agriculture to Market Manipulation: A New Frontier in the Legal Community*, 17 MINN. J.L. SCI. & TECH. 489 (2016) (arguing precision agriculture that comprehensively constitutes a big data catalog of land quality and growing conditions would inform commodities market manipulators); Michael E. Sykuta, *Big Data in Agriculture: Property Rights, Privacy and Competition in Ag Data Services*, 19 INT'L. FOOD & AGRIBUS. MGMT REV. 57 (2016) (arguing to diminish privacy rights to enhance commodities market transparency).

223. *See* Tom C.W. Lin, *The New Market Manipulation*, 66 EMORY L.J. 1253 (2016).

224. *See generally* Russell Hotten, *Gamestop: 'Failing' Firm Soars in Value As Amateurs Buy Stock,* BBC NEWS (Jan. 27, 2021), https://www.bbc.com/news/business-55817918.

225. Junjie Wang, Shuigeng Zhou & Jihong Guan, *Detecting Potential Collusive Cliques in Futures Markets Based on Trading Behaviors from Real Data*, 92 NEUROCOMPUTING 44 (2012) (*modeling* method to analyze events by calculating a correlation coefficient matrix over all eligible unified aggregated time series to construct weighted graphs that detect collusive cliques colluding to manipulate future markets).

226. *See* Jia Zhai, Yi Cao & Xuemei Ding, *Data Analytic Approach for Manipulation Detection in Stock Market*, 50 REV. QUANTITATIVE FIN. & ACCT. 897 (2018).

227. *See, e.g.,* Koosha Golmohammadi & Osmar R. Zaiane, *Sentiment Analysis on Twitter to Improve Time Series Contextual Anomaly Detection for Detecting Stock Market Manipulation*, BIG DATA ANALY. & KNOWLEDGE DISCOVERY 327.

228. Lorraine Bailey, *Judge Tosses Claims of Wall Street 'Fear Index' Manipulation*, COURTHOUSE NEWS SERV. (May 30, 2019).

District of Illinois. Although the antitrust complaint was dismissed,[229] the VIX manipulation scheme could signal how regulators might use big data analytics in the future to prospect for anomalies, perhaps preventing further harms. While no FINRA findings are yet available, the CBOE filed for SRO rule changes at the SEC to modify its opening processes that the CBOE argues might diminish VIX manipulability.[230]

4. Comprehensive & Real-Time, Direct Trading Feeds

Consider this section as proposing a straw man extension of the RegTech sandbox concept.[231] New FinTechs, RegTechs or innovation in almost any field can be highly disruptive to the status quo. Stealth deployment chronically imposes negative externalities that cause varying degrees of harm. By contrast, regulatory agencies authorized to address emerging innovations ex ante, are in much better positions to anticipate harms, successes, and the resulting shifts in industry practices. Advocates of sandbox experimentation, which the FCA was the first to pioneer in June 2016,[232] suggest that (i) legislators should authorize this framework, (ii) regulators should implement such authority by conducting highly isolated and controlled experiments, and (iii) regulated entities should test FinTech innovative tools and products, as well as RegTech methods. Well-conceived sandboxes isolate prototype RegTech and FinTech experimentation so there is minimal harm externalized to markets, regulatory program efficacy and society generally. Analysis of resulting behaviors from these experimental instruments, platforms and RegTech methods give early warning. Sandboxes can identify the successful designs, as well as the harmful side effects of this research with increased disclosure and supervision, in real time, thereby informing the refinement, phased-introduction and ultimate real-world deployment.

Financial market regulation has generally followed a pattern. Initially the market develops without much oversight under laissez-faire conditions. Then

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229. *In re Chi. Bd. Options Exch. Volatility Index Manipulation Antitrust Litig.*, 390 F. Supp. 3d 916 (N.D. Ill. 2019), http://www.courthousenews.com/wp-content/uploads/2019/05/cboe-vix.pdf.

230. Self-Regulatory Organizations*;* CBOE Exchange, Inc; Notice of Filing of a Proposed Rule Change to Amend the Exchange's Opening Process Including on VIX Settlement Days, SEC Exchange Act Release No. 34-86387, 84 Fed. Reg. 35147 (proposed July 16, 2019).

231. *See, e.g.,* DOUGLAS W. ARNER, JÀNOS BARBERIS & ROSS P. BUCKLEY, FINTECH AND REGTECH IN A NUTSHELL, AND THE FUTURE IN A SANDBOX 16–18 (CFA Inst. Res. Foun. ed., 2017); Douglas W. Arner, Janos Barberis & Ross P. Buckey, *Fintech, Regtech, And The Reconceptualization of Financial Regulation*, 37 NW. J. INT'L L. & BUS. 371, 408–11 (2017); Michael M. Piri, *The Changing Landscapes of FinTech and RegTech: Why the United States Should Create a Federal Regulatory Sandbox*, 2 BUS. & FIN. L. REV. 233, 246–49 (2019); Dirk A. Zetzsche, and Zetzsche, Dirk A., Ross P. Buckley, Janos N. Barberis & Douglas W. Arner, *Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation*, 23 FORDHAM J. CORP. & FIN. L. 31, 64 (2017).

232. *See Regulatory Sandbox*, FIN. CONDUCT AUTH. (Nov. 5, 2015), https://www.fca.org.uk/firms/regulatory-sandbox.

regulations may follow if a public policy debate over the market innovation triggers perception that there are abuses or markets failures. Financial market regulation laws and self-regulatory standards have been imposed throughout the world predominately in this second step. Such laws have focused on transparency. A smaller, but significant subset of substantive regulations is also noted.[233]

Transparency typically invades individual privacy and institutional confidentiality. Justifications for such intrusions are typically offered as a balance favoring societal goals of market integrity, efficiency, and liquidity. The effectiveness of public policies requiring transparency is commonly evaluated with ex post, cost-benefit, and risk-benefit analyses.[234] These appraisals focus on the aggregate costs of individual and institutional privacy deprivation (proprietary loss, competitive strategic revelation) as set against systemic vitality. Any balance reached, however, must include some intrusions because as Merritt Fox has described, in disclosure regimes that are completely voluntary, companies will probably disclose a suboptimal amount of proprietary data concerning their businesses and their operation models, because the disclosing companies will be unable to capture the major value that such disclosures provide to their competitors.[235] This is particularly the case when disclosing proprietary data could result in a disclosing company losing its competitive advantage.[236] But, enforcing stricter and broader disclosure requirements means adding significant costs to the disclosing companies, and a full examination of the normative case for enhanced disclosure probably mandates a more detailed and carefully tailored cost-benefit analysis.[237] Thus, while there are clearly benefits to an enhanced disclosure regime, such benefits require a careful examination.

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233. E.g., capital requirements, proxy process regulation, transaction standardization, prohibited transactions, prohibited manipulation, market intermediary structure and professionalism, and the licensing of exchanges and transaction processes.

234. The problem, however, is that in many cases, agencies' cost benefit analyses lack basic process visibility, which means that the analyses themselves and their role in the decision-making process is not an evident or obvious one. Moreover, most cost benefit analyses lack visibility in terms of the related policy impacts, as it is common for analyses to not quantify or monetize the examined costs and benefits. *See* Caroline Cecot & Robert W. Hahn, *Transparency in Agency Cost-Benefit Analysis*, 72 ADMIN. L. REV. 157, 158 (2020).

235. Merritt B. Fox, *Retaining Mandatory Securities Disclosure: Why Issuer Choice Is Not Investor Empowerment*, 85 VA. L. REV. 1335, 1339, 1345–46 (1999).

236. Robert P. Bartlett, III, *Inefficiencies in the Information Thicket: A Case Study of Derivative Disclosures During the Financial Crisis*, 36 J. CORP. L. 1, 57 (2010) (citing Michael D. Guttentag, *An Argument for Imposing Disclosure Requirements on Public Companies*, FLA ST. U. L. REV. 123, 147 (2004)) (using AIG as an example describing how "these considerations might deter a firm from voluntarily disclosing its derivative positions was clearly illustrated in the refusal of AIG and the New York Federal Reserve to disclose details about AIG's portfolio of insured CDOs until a member of Congress released the information to the media after a heated Congressional investigation into the lack of transparency surrounding AIG's rescue.").

237. Cf. Roberta Romano, *The Need for Competition in International Securities Regulation*, 2 THEORETICAL INQUIRIES L. 387, 432–33 (2001).

5. Dodd-Frank Reforms Enable RegTech Compliance

The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank)[238] was intended to continue this balance between transparency and substantive regulation, generally favoring the former,[239] but with a few instances of favoring the latter.[240] For example, some controversial substantive provisions are regulations prohibiting certain practices identified from the 2008 financial crisis as imposing unacceptable levels of systemic risk.[241] Integral to the problem is the distinction between ex-ante and ex-post transaction transparency. The latter is de rigueur following criminal prosecution, enforcement by government regulatory agencies and self-regulatory organizations, and civil damage lawsuits under private rights of action. That is, investigations, subpoenaed records, and pre-trial discovery produce almost comprehensive transaction records that reveal high granularity in past trades by all individuals and institutions suspected of involvement.[242]

By contrast, ex-ante transparency can enhance anticipatory RegTech efforts.[243] This approach is not traditionally deployed to reveal nascent systemic risks. As a result, ex-ante data mining and network science analysis are argued here to hold promise for the anticipation and detection of risky positions, identi-

238. *See* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111–203, 124 Stat. 1376 (2010).

239. For instance, a regulation regarding approximately $110 billion dollars that get sent every year from individuals in the U.S. to other countries in remittances. *See* Michael J. Lorden, *Dodd-Frank 1073: Creating the Well-Informed Remittance Consumer,* 25 LOY. CONSUMER L. REV. 266, 283 (2013). The regulation, which is known as Dodd-Frank 1073, went into effect on February 7, 2013, with a goal to increase transparency for consumers, and that was met with much criticism from the banking community. *Id.* at 268. The regulation is meant to create a "comprehensive new system of consumer protections for remittance transfers" and "provide consumers with better information for comparison shopping." *Id.* at 270.

240. *See, e.g.,* Digital Realty Tr., Inc. v. Somers, 138 S. Ct. 767, 773 (2018) ("Passed in the wake of the 2008 financial crisis, Dodd–Frank aimed to "promote the financial stability of the United States by improving accountability and transparency in the financial system.")

241. *See, e.g.*, Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111–203, § 619, 124 Stat. 1376 (2010) (the Volcker Rule bans commercial banks from using customer deposits for their own profit).

242. Of course, some private trades may remain opaque. For the purposes of this exemplar, these over-the-counter (OTC) trades are ignored. However, there may still be situations where the size of these transactions, the concerted efforts at maintaining their opacity and the influential positions of the counter-parties may render them material.

243. Somewhat similarly, most scholars have advocated for an ex-ante approach in connection with enhancing transparency and oversight as well as "increased disclosure from the black box of the credit rating agencies' ratings process" as was eventually required in the Dodd-Frank itself (although in vaguer terms). *E.g.,* David A. Skeel, Jr. et al., *Inside-Out Corporate Governance*, 37 J. CORP. L. 147, 176–77 (2011) (explaining some scholars argue "that CRAs should be forced to disclose to the public all rating agency actions, including all initial ratings proposals, downgrades, upgrades, placements on watch, and removal of ratings, in addition to unsolicited ratings and subscriber-paid ratings . . . [and while some] worry that mandatory disclosure of all actions would undermine the business model of ratings agencies, the potential benefits of disclosure in significantly reshaping the issuer-CRA relationship seem too great to forgo.").

fication of concentrated relationships or isolation of centrality in transaction networks. Indeed, ex-ante disclosure has generally been quite limited—reserved for aggregated financial condition data and extraordinary events, but without revealing such fine-grained detail.

Dodd-Frank could have been implemented to change this model. This change could have enabled ex-ante risk discovery that might facilitate risk minimization, as focused through regulators, and as implemented by market participants and intermediaries; the classic RegTech compliance solution. To achieve this systemic risk control, Dodd-Frank created some new regulatory programs and at least three new supervising agencies, including the Financial Stability Oversight Council (FSOC), the Treasury Department's Office of Financial Research, and the CFPB. The Dodd-Frank authorizes these agencies to ex-ante gather "position" information that as suggested could reveal systemic financial market risks using network analysis of large data sets of transactions, in both the consumer and financial institution markets.[244]

The direct and indirect costs of transparency inherent in the Dodd-Frank's new institutional structure would have resulted from ex-ante transaction disclosures. First, federal regulatory agencies and their regulatory mechanisms could have been designed to add monitoring programs that balance the privacy and confidentiality risks of Dodd-Frank programs against the prevention of market collapse. Second, anticipated reactions to transparency regulations by financial market participants might have resulted in offshoring of domestically executed transactions or in the relocation of positions into nations or markets with less intrusive scrutiny of private financial transactions. Thus, the traditional argument that overly strict (transparency) regulations incentivize regulatory arbitrage could have been counteracted with regulatory response. That reaction could have attempted to enhance inter-market, international regulatory coordination harmonizing systemic risk regulation among all nations with prospective market or trading platform potential. This would leave no haven as refuge. Third, ex-ante transparency risks for comprehensive transaction data must be assessed by regulators. For example, there may be unintended consequences of real-time data feeds monitoring confidential transaction logs of traditional financial intermediaries, requiring standardized instruments, or requiring centralized and transparent clearing mechanisms.

244. *E.g.,* Daniel J. Hunt, *Just Grin and Bear It: Why Consistent Use of Individual Bailouts Under Section 13(3) of the Federal Reserve Act Is A Necessary Evil to Combat Economic "Mass Destruction',* 6 GEO. MASON J. INT'L COM. L. 59, 87 (2014) ("Composed of high-level government leaders including the Secretary of Treasury and the Chairman of the Fed, the FSOC incorporates Congress's "preference for ex-ante solutions to systemic risk concerns . . . . Ultimately, the FSOC aims to establish "ex-ante" approaches to preventing and containing systemic risk").

6. Satisficing Opposition to Comprehensive Data Feeds

Strong opposition to ex-ante, real-time, sensor systems should be anticipated if regulation results in heretofore unavailable transparency or analysis of market makers, regular scrutiny of the specialists' "book," or forced sunlight into dark pools using network science analysis. Opponents can be expected to argue that transparency would reveal proprietary trading strategies needed to attract participants who supply needed market liquidity.[245] Furthermore, transparency can be expected to incentivize regulatory enforcement and private litigation. Finally, transparency can be anticipated to breed substantive market mechanism regulation. Examples might include additional circuit breakers, or other early warnings at the approach thresholds of trading measures, the mandatory unwinding of positions as they surpass standard risk profiles, and structural reforms that could adjust the architecture of the financial system.

To attenuate intrusion risks, regulatory agencies can temper comprehensive big data collection requirements that reveal the whole portfolio of transactions by every market participant. For example, sampling techniques might be adopted rather than requiring comprehensive intrusions. As to confining the public-visibility of transaction transparency, there are numerous middle-ground approaches possible. For example, the self-evaluation privilege could be adapted to shield data held by third party risk management consulting firms.[246] This re-intermediation could be in SRO form if not "housed" in government controlled or related agencies. FOIA exceptions could be adapted to protect some aspects of this data, such as be delaying real-time disclosure and/or anonymizing counter-party identities. Trading strategy confidentiality and trading partner privacy could be maintained absent privileged access to the full transaction data when it becomes necessary for robust systemic financial risk analysis or litigation.

With strong incentives for such analysis and widespread perception that these benefits regularly outweigh the costs, markets could conceivably develop for systemic risk assessment by independent systemic analysis service organizations (SASO). Pressures can be expected to adapt traditional business and analytical models used by the ratings agencies to improve SASO performance and identify any conflicts of interest for reduction. Especially, if it can help businesses avert public embarrassment or even consumer backlash.[247] Some stand-

245. *See, e.g.*, John W. Bagby, Big Data as Efficient National Market System Enabler: Dodd-Frank Balances Systemic Risk with Privacy & Confidentiality, Univ. Indianapolis (Apr. 8, 2016).

246. *See. e.g.*, Bredice v. Doctors Hospital, Inc., 50 F.R.D. 249 (D.C. 1970) (implying a self-evaluation privilege); Nancy C. Crisman, & Arthur F. Mathews, *Limited Waiver of Attorney-Client Privilege and Work-Product Doctrine in Internal Corporate Investigations: An Emerging Corporate Self-Evaluation Privilege*, 21 AM. CRIM. L. REV. 123 (1983); John W. Bagby, Paula C. Murray, & Eric T. Andrews, *How Green Was My Balance Sheet: Corporate Liability and Environmental Disclosure*, 14 VA. ENV'TL. L. J. 225–342 (Winter 1995) (*discussing* statutory self-evaluation privilege); *but see* James Cox, *Case against a Judicially Created, Common-Law Self-Audit or Self-Evaluation Privilege Applicable to Environmental Cases*, 15 FORDHAM ENVTL. L. REV. 1 (2004).

247. *See* Jules Polonetsky, Omer Tene & Joseph Jerome, *Beyond the Common Rule: Ethical Structures for Data Research in Non-Academic Settings*, 13 COLO. TECH. L.J. 333, 338 (2015).

ardization and validation of systemic financial risk analytics can be expected to attract such analytics in-house to firms in the financial services industry. This development could further reduce costs, enhance analysis, and thereby permit regular analysis to yield useful signals that enable risk reduction remediation at significantly lower transparency risk.

V. WHAT ARE SOME LOGICAL NEXT STEPS?

This Article sheds some light on how RegTech could inspire political opposition resulting in litigation challenges. Libertarian arguments that view RegTech as intrusive stealth re-regulation raise issues likely foundational to that ideology. Privacy and confidentiality deprivations are likely among RegTech methods that should channel careful RegTech design. Indeed, government transparency (FOIA) must be balanced with regulatory goals. Consider how pathogen containment strategies deploying track and trace protocols (e.g., COVID 19) are a logical corollary to Smart City design. Test, track, and trace (T3) will surely degrade privacy in exchange for promises of more effective contagion vector provenance and disease transmission forensics.[248] Will such privacy intrusions survive the (hopefully) inevitable COVID 19 decline? If privacy is surely dying perhaps some "post-9/11-style" cataclysm-induced privacy intrusions will need to be periodically reconsidered and reauthorized.[249] Next, RegTech advocates promise cost saving and robust efficacy benefits.[250] However, regulated entities must likely invest substantially to make RegTech successful. Therefore, higher costs for RegTech ultimately seem likely, at least during startup. These higher initiation and maintenance costs will likely be shared by both regulators, regulated entities, and their customers.[251]

RegTech's expected costs must be explored to achieve balance against predictable societal benefits. Researchers should explore the obvious initial hy-

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Moreover, in such cases businesses must also "employ ethical review processes and instill issue-spotting skills in employees throughout the organization." *Id.*

248. S*ee* Sangchul Park, Gina Jeehyun Choi & Haksoo Ko, *Information technology–based tracing strategy in response to COVID-19 in South Korea—privacy controversies*, JAMA NETWORK (Apr. 23, 2020), https://jamanetwork.com/journals/jama/fullarticle/2765252; Leesa Lin & Zhiyuan Hou, *Combat COVID-19 with Artificial Intelligence and Big Data,* J. TRAVEL MED. 1, 5–6 (2020).

249. *See, e.g.*, Peter Margulies, *Reauthorizing the FISA Amendments Act: A Blueprint for Enhancing Privacy Protections and Preserving Foreign Intelligence Capabilities*, 12 J. BUS. & TECH. L. 23 (2016).

250. At least some attention focuses on the effectiveness of RegTech. *See, e.g.*, Amélie Labbé, *Why Regtech Must be Regulated*, INT'L. FIN. L. REV. (Nov. 10, 2017) https://www.iflr.com/Article/3766183/Why-regtech-must-be-regulated.html.

251. *See generally*, John W. Bagby, *Regulatory Impact Analyses: Towards a Reasonable Economic Impact from Federal Regulations*, 19 NEW ENG. L. REV. 533 (1984) (arguing Presidential imposition of cost-benefit analyses to justify new major rules further opens opportunities for presidential administration imposition of political judgments by dominating agency independence and agency staff inspired interpretation of statutory missions).

potheses that RegTech cost imposition will shift to regulated entities, forcing the latter to behave differently. Any resulting cost savings from electronic monitoring must be balanced with loss of privacy and confidentiality. From the regulator perspective, the chronic lag in deploying computer and telecommunications technologies to sustain their statutory missions makes many new RegTech capabilities unattainable. In order to maintain regulatory agency functionality during (seemingly perpetual) periods of budget pressure, regulators must consider that initial cost increases must be balanced with long-term cost containment. This is a long-term investment perspective common in the private sector but increasingly necessary to maintain regulatory missions. The regulator vs. regulated entity relationship could evolve to symbiotic but likely retains the cat and mouse game, arms race that characterizes most of history.

RegTech may obviate deregulation if it is done right. RegTech makes for a fiercer government beast because regulatory methods are mechanized on both sides, allowing force reduction, cost savings, and regulated entity's touting of faithful compliance. Consider how RegTech may have enabled enhanced regulation in the post COVID 19 homework/tele-commuting adaptation revolution. RegTech is likely to exhibit all the cyber security difficulties already plaguing electronic commerce: online sales, financial services, banking, trading, etc. RegTech may be also depend on intermediaries' risk.[252] Third party service providers bring problems that include the IP of these service providers' methods and data; the licensing costs and restrictions of using others' data and algorithms; the need to deal with the challenges associated with where many third parties are situated, which is beyond serviceable jurisdictions; the issues associated with ISP, IaaS, and SaaS providers that impose liability waivers in their service level agreements (SLA); the administration of service level management (SLM); and metrics that can be daunting. Additionally, restrictive contractual terms, like non-disclosure agreements (NDA), lock-in provisions, and non-competes make RegTech solutions complex to manage.

CONCLUSION

RegTech shows great promise in narrowing the RegLag gap. RegTech programs can improve regulatory agency clairvoyance and help regulators to adapt more aggressively to changing regulable activities, such as by using anticipatory approaches. But any such transformation will remain elusive in the near to medium future for various reasons, including the technology diffusion lag. Opposition at nearly every turn should be anticipated if RegTech is to become as effective as hoped. Sub rosa undermining regulatory agencies by de-regulatory

252. *See e.g.* David England, *COVID-19 Puts Third-Party Risk Management Under a Microscope,* Corporate Compliance Insight (June 18, 2020) https://www.corporatecompliance insights.com/covid-19-third-party-risk-management/; *Why You Should Pay Attention To Regtech & Third-Party Risks,* The Risk Management Association, (Dec. 20, 2019), https://www.rmahq.org /why-you-should-pay-attention-to-regtech-and-third-party-risks/.

ideological forces will undercut RegTech's promise. Considerable expense will be needed initially and over time for IT hardware, training, specialized consulting, bulk data, and third-party service providers both for regulators and regulated entities. New procurement expertise will often be needed, particularly for regulatory agencies. Perhaps centralized procurement and adaptation will be needed for state agencies and for federal agencies. Some centralized, coordinating agency with technical expertise is needed, but it cannot be one that is very politicized or Presidential administration dependent, such as the OMB,[253] or what the CFPB might become after *Seila*, as the case's biggest result will probably be having every elected president likely appointing a new bureau director.[254] Therefore, based on these criteria, in some respects, the General Services Administration (GSA) and NIST might be appropriate. Likewise, there needs to be an independent inspector general (OIG) that assesses RegTech's efficacy and efficiency, even if the potential agency which will do such assessments appears as non-existent in the current political environment.[255]

253. *See, e.g.*, John W. Bagby, Thwarting Malicious Assaults on Democracy: A Compelling Role for Big Data Analytics (Apr. 28, 2018) (submitted by author at Big Data Workshop, Babson College, Wellesley, MA), https://ssrn. Com/abstract=3299620 (explaining the centrality of OMB in regulatory reform, but also why it suffers from extreme political influence from the Presidential administration).

254. *See* Nizan Geslevich Packin, *Show Me the Data (About the) Money!,* UTAH L. REV. 1277, 1292 (2021).

255. *See, e.g*., Steven Croley, *White House Review of Agency Rulemaking: An Empirical Investigation*, 70 UNIV. CHIC. L. REV. 821–885 (2003) (discussing how the OMB exerts strong agency discipline, especially in significant deregulatory periods such as under Reagan's administrations).