

THE NATURE OF THE FINTECH FIRM

Howell E. Jackson*

INTRODUCTION

The title of this essay is an homage to Ronald Coase’s classic work, *The Nature of the Firm*, in which Professor Coase offered up a pithy but profound exposition of the question why some business activities are located within the discretionary control of corporate management while others are exchanged through arm’s length transactions in the marketplace.¹ As explicated decades later in the press release announcing the award of Professor Coase’s Nobel Prize in the Economic Sciences, the Royal Swedish Academy of Sciences identified the article’s focus on transaction costs for market transactions, as well as production costs for activities organized within the firm, as being of “critical importance”:

If these circumstances are taken into account, it may be concluded that a firm originates when allocative measures are carried out at lower total production, contract and administrative costs within the firm than by means of purchases and sales on the market. Similarly, a firm expands to the point where an additional allocative measure

* James S. Reid, Jr., Professor of Law, Harvard University. This essay draws on the work of and discussions with my students at Harvard Law School. My thanks to Professor Dirk Andreas Zetsche for helpful comments and suggestions.

1. Ronald H. Coase, *The Nature of the Firm*, 4 *ECONOMICA* 386, 392 (1937). I am hardly the first to make a connection between Professor Coase’s classic article and the impact of technological developments on optimal models of productions. See, e.g., Yochai Benkler, *Coase’s Penguin, or, Linux and The Nature of the Firm*, 112 *YALE L.J.* 369 (2002) (exploring the potential for peer production in a technologically advanced economy). In a related vein, Luca Enriques & Dirk Zetsche, *Corporate Technologies and the Tech Nirvana* (Eur. Corp. Governance Inst., Law Working Paper No. 457/2019, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3392321, has recently engaged in a similarly spirited exercise exploring (with some skepticism) the capacity of artificial intelligence and other fintech innovations to revolutionize corporate governance.

costs more internally than it would through a contract on markets. If transaction costs were zero, no firms would arise. All allocation would take place through simple contracts between individuals.²

For years, Professor Coase's article has inspired corporate theorists and earned a place in the pantheon of corporate law scholarship. In this essay, I return to *The Nature of the Firm* to explore the fintech revolution and the supervisory challenges that aspects of this revolution have posed for regulatory authorities. Several of the examples I discuss concern the distinction between activities located within a firm and those arranged through market transactions often supplied through new and specialized fintech entities. Two others explore the changing nature of what it means to exercise managerial discretion in an era of machine learning and artificial intelligence.

I. FINANCE AND FINTECH

While other scholars have offered a number of plausible definitions of fintech,³ my own preference is to define the phenomenon as encompassing

2. Press Release, Royal Swedish Academy of Sciences (Oct. 15, 1991) (available at <https://www.nobelprize.org/prizes/economic-sciences/1991/press-release/>).

3. See, e.g., Chris Brummer & Yesha Yadav, *Fintech and the Innovation Trilemma*, 108 GEO. L.J. 235, 241 (2019) ("the use of digital technologies in finance"); William Magnuson, *Regulating Fintech*, VAND. L. REV. 1167, 1174 (2018) ("the new breed of companies that specialize in providing financial services through technologically enabled mobile and online platforms"); Rory Van Loo, *Making Innovation More Competitive: The Case of Fintech*, 65 UCLA L. REV. 232, 239 (2018) ("Fintech is used here to refer to the relatively new category of companies whose business models are based on digital products[, but] leaves out legacy banks . . . which may now offer similar products but whose services originally lacked a digital component."). In its recent report on fintech and related developments, the U.S. Treasury Department did not offer a precise definition but organized its discussion of fintech in a manner analogous to my own, embracing both innovations within traditional financial firms and the emergence of new technology-based firms. See U.S. DEP'T OF TREASURY, A FINANCIAL SYSTEM THAT CREATES ECONOMIC OPPORTUNITY: NONBANK FINANCIALS, FINTECH, AND INNOVATION 5 (2018). Professor Dirk Zetsche and his many co-authors have refined the concept of fintech to distinguish "regtech," the emergence of regulatory technologies, and "techfin," the entrance of primarily technology companies (like Google or Apple) into the world of finance. See, e.g., Dirk A. Zetsche, Douglas W. Arner, Ross P. Buckley & Rolf H. Weber, *The Future of Data-Driven Finance and Regtech: Lessons from EU Big Bang II* (Eur. Banking Inst. Working Paper Series No. 35, 2019), <https://ssrn.com/abstract=3359399>; Dirk A. Zetsche, Ross P. Buckley, Douglas W. Arner & János N. Barberis, *From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance*, 14 N.Y.U.

a wide range of private and regulatory innovations that have become possible through the rapid decline in the cost of computing, accompanied by the widespread availability of reliable, high-speed connectivity (typically over the internet), and an explosion of newly collected data about a broad swath of personal and commercial characteristics and behaviors. This technological transformation has potentially huge implications for the domain of finance, which, to paraphrase Professors Merton and Bodie, can be helpfully demarked as “the movement of value across time and space under conditions of uncertainty that are not fully knowable by other private parties or government agents.”⁴ The critical concept here is “conditions of uncertainty,” which includes, among other things, the uncertainty whether a borrower will repay his or her loan, the uncertainty whether an insured risk (like an earthquake) will come to pass, the uncertainty whether providers of liquidity (like repurchase counterparties or market-makers for bonds) will withdraw unexpectedly from their markets, or the uncertainty whether interest rates will rise or fall as expected. On many dimensions, fintech allows for these and other uncertainties (i.e., risks) to be managed in new, more efficient, and more expeditious ways. Moreover, as I explain below, fintech innovations allow for the management and oversight of many risks and associated operations to be contracted out of regulated entities and into new fintech firms or market transactions. Sometimes, fintech innovations create the possibility of entirely new kinds of market transactions, as is the case with the introduction of new networks such as payment platforms or clearing systems.⁵ That is, the rise of fintech increases the set of viable arrangements for producing financial services, potentially relocating significant amounts of activities that were previously based within the regulated firm and subject to management discretion in a well-supervised environment.⁶ Similarly, technological developments also have

J.L. & BUS. 393 (2018). See also Douglas W. Arner, János Barberis & Ross P. Buckley, *The Evolution of FinTech: A New Post-Crisis Paradigm*, 47 GEO. J. INT’L L. 1271, 1272 (2015-2016) (defining fintech as “the use of technology to deliver financial solutions”).

4. ZVI BODIE & ROBERT C. MERTON, FINANCE 2 (2000).

5. See Enriques & Zetsche, *supra* note 1, at 11-13.

6. In *The Nature of the Firm*, Professor Coase identified technological developments—then, telephones and telegraphs—as having the potential for changing the scope of efficient firm size, though he interpreted these changes as creating the potential for larger firms rather than the shrinking of incumbent firms contemplated in the text. See Coase, *supra* note 1, at 397.

the potential to improve the ability of government agents to monitor financial activity and identify more rapidly emerging risks.

The erosion of regulated financial firms' franchise substantially predates the rise of the internet or the introduction of distributed ledgers, and actually was well underway when Steve Jobs was still working out of his garage.⁷ At least as early as the 1970s, the expansion of commercial paper was an early example of disintermediation: short-term funding for high-quality corporate issuers moved from intermediated bank loans into disintermediated commercial paper issuances. The process accelerated in the 1990s with the explosion of securitization practices whereby many other commercial and consumer loans found funding through capital market transactions, and banks and thrifts adopted new originate-to-distribute business models. The emergence of marketplace lending in the new millennium—and the first illustration in this chronology that might properly be labeled “fintech”—allowed yet more kinds of consumer borrowing to be disintermediated, and in some cases crowdsourced with retail funding, but more commonly now through funding from institutional investors. Moving away from credit markets, one can also observe over the past several decades how swaps and other derivatives moved interest rate risk, foreign exchange risk, credit risk, and even weather risk into the capital markets and off the balance sheets of regulated entities. Innovations in information processing, including the development of options-pricing models and technological developments such as the Bloomberg terminal, as well as the work of the now often maligned—but still historically important—rating agencies, made these advances in finance possible. Now, fintech is starting to produce similar effects, only more, better, faster and more economical.

II. ENTITIES VERSUS ACTIVITIES AND THE CHALLENGE OF FINTECH

A classic—and in many areas still dominant—approach to financial regulation is based on the regulation of entities. If a firm engages in some core financial function—like banking, insurance, or the securities

7. The history of the developments discussed in this paragraph are reviewed in MICHAEL S. BARR, HOWELL E. JACKSON & MARGARET E. TAHYAR, *FINANCIAL REGULATION: LAW AND POLICY* 207-13, 372-74, 457-61 & 1237-68 (2nd ed. 2018) (Foundation Press).

business—then the firm itself (often along with all affiliated entities) is subject to strict regulation, such as activities restrictions and capital requirements, as well as supervisory oversight, typically reporting, examination, and an enforcement regime. Once subject to entity-based regulation, a financial firm also enjoys certain benefits not available to other firms. For example, certain aspects of the U.S. payments system are available only to insured depository institutions. Similarly, insured depositories are the only entities that are permitted to “export” interest rates from their home jurisdictions, thereby preempting local usury laws and other state-based consumer protections in other jurisdictions.

Faced with a burdensome and costly system of entity-based regulation, the fintech firm has every incentive to organize its behaviors to stay outside the relevant regulatory perimeters and simply contract for the provision of critical functions, like access to payment systems, through market transactions with already-regulated entities. So, for example, when Apple wanted to launch Apple Pay, it simply entered into contracts with existing banks and credit card providers to use their payment access and monetized its payments interface through a share of interchange fees.⁸ Similarly, when marketplace lenders wanted the advantages of relaxed usury rules and uniform consumer protection statutes, they negotiated with existing banks located in business-friendly jurisdictions through a process known as “rent-a-charter,” whereby the contracting bank formally originates all loans and then transfers them to the marketplace lenders for permanent funding and servicing.⁹ Or, to put it in Coasean terms, as the domain of market-based transactions increased with technological developments, fewer activities had to be located within the discretionary (and costly) management of the regulated firm itself.¹⁰ One of the reasons for the low enthusiasm

8. See Brummer & Yadav, *supra* note 3, at 277 & n.189.

9. See Noah Buhayar, *Where Peer-to-Peer Loans Are Born*, BLOOMBERG BUSINESSWEEK (Apr. 16, 2015), <https://www.bloomberg.com/news/articles/2015-04-16/webbank-where-peer-to-peer-loans-are-born> [<https://perma.cc/49LQ-P8G4>].

10. In his essay, Professor Coase identified government polices as having the potential to influence the location of economic activity. His example concerned sales taxes, which applied primarily to market transactions and thus encouraged the location of activities to within the firm. See Coase, *supra* note 1, at 393. With respect to the examples discussed in the main text, government requirements imposed on regulated firms—or example capital requirements or activities restrictions—operate as a tax on those firms, thereby encouraging the movement of activities to market transactions with unregulated firms.

surrounding the Office of the Comptroller of the Currency's (OCC) much publicized efforts to develop a new fintech charter that would attract fintech firms into the regulated space—aside from legal challenges from entrenched interests¹¹—has been the simple fact that fintech firms have many paths to gaining access to regulatory benefits without the burdens of direct regulation and supervisory control.¹²

While new fintech entrants have incentives to tap into the regulated sector for the bare minimum of activities, regulated entities also have incentives to “push out” new fintech services into unaffiliated firms operating beyond the regulatory perimeter. Such push-out strategies allow for innovations outside the constraints of supervisory controls while providing a potentially cost-effective mechanism for diversifying revenue streams and customer services of regulated entities. Prominent examples would include efforts of established firms to provide customer access to crypto-currencies, but without assuming full responsibility for custody and other customer protections typically required of broker-dealers.¹³ The role of several major financial firms in supporting Facebook's Libra initiative for a new stable-value cryptocurrency (a stablecoin), but locating it in a new legally distinct non-U.S. entity, offers another still unfolding illustration of a push-out strategy to accommodate fintech innovations beyond traditional regulatory perimeters, posing questions (among other things) with respect of the

11. Rachel Witkowski, *Google and PayPal Explored OCC's Fintech Charter, Then Walked Away*, AM. BANKER (July 19, 2019), <https://www.americanbanker.com/news/google-and-paypal-explored-occs-fintech-charter-then-walked-away> [<https://perma.cc/LZA9-2R9H>]. See also *Vullo v. Office of the Comptroller of the Currency*, 378 F. Supp. 3d 271, 292 (S.D.N.Y. May 2, 2019) (finding that New York state banking regulator had standing to challenge the fintech charter, and that it appeared to at least partially exceed OCC's authority), *final judgment entered sub nom. Lacewell v. Office of the Comptroller of the Currency*, No. 18-cv-8377 (S.D.N.Y. Oct. 21, 2019) (permanently enjoining OCC from regulating any “fintech applicant[] . . . that do[es] not accept deposits”).

12. Lea Nonniger, *Tech and Fintech Firms Aren't Interested in the OCC's Fintech Charter*, BUSINESS INSIDER (June 18, 2019), <https://www.businessinsider.com/google-paypal-not-interested-in-occ-fintech-charter-2019-6> [<https://perma.cc/Z8WJ-NERJ>].

13. For an overview of these issues including a reference to “non-custodial models,” see Div. of Trading & Mts., Sec. & Exch. Comm'n & Office of Gen Counsel, Fin. Indus. Regulatory Auth., *Joint Staff Statement on Broker-Dealer Custody of Digital Asset Securities* (July 8, 2019), SEC. & EXCH. COMM'N, <https://www.sec.gov/news/public-statement/joint-staff-statement-broker-dealer-custody-digital-asset-securities> [<https://perma.cc/4Q3J-6BHT>]. For a more general treatment of the subject, see Timothy G. Massad, *It's Time to Strengthen the Regulation of Crypto-Assets*, BROOKINGS (Mar. 2019), <https://www.brookings.edu/research/its-time-to-strengthen-the-regulation-of-crypto-assets/> [<https://perma.cc/H4Y5-766G>].

enterprise's ability to ensure compliance with anti-money laundering requirements.¹⁴

III. MOUNTING AN EFFECTIVE DEFENSE TO REGULATORY PERIMETERS

Drawing an effective line between activities that must be brought within the regulatory perimeter for entity regulation and those activities that can remain outside of direct supervisory oversight is a fraught task.¹⁵ Too bright a line invites evasion through complicated contracting terms with licensing and profit-sharing arrangements that are difficult to interpret and police. Too loose a definition (if backed by the threat of credible enforcement) will discourage innovation and add to compliance burdens. Oftentimes, innovations will occur and contractual arrangements will be put in place before regulatory officials have even focused on the issue, leaving regulators in the unenviable position of having to retrieve the horses once they are out of the barn and already lent out for hire.¹⁶

To be sure, fintech firms have not always been able to escape the scrutiny and oversight of financial regulation. Many fintech innovators in the payments space have evaded direct regulation as banks, but must still comply with state money transmitter requirements. The U.S. operations of PayPal offer one example of this approach.¹⁷ Marketplace lenders that do not rely on the rent-a-charter tactic will also generally be subject to state consumer lending laws.¹⁸ In some instances, regulatory authorities may

14. See Timothy Massad, *Is Facebook Libra a Betrayal of Satoshi Nakamoto's Vision?*, FORTUNE (July 15, 2019), <https://fortune.com/2019/07/15/facebook-libra-coin-cryptocurrency-hearing/> [<https://perma.cc/FM95-6ER7>]. See also Dirk A. Zetsche, Ross P. Buckley & Douglas W. Arner, *Regulating LIBRA: The Transformative Potential of Facebook's Cryptocurrency and Possible Regulatory Responses* (Eur. Banking Inst Working Paper Series, No. 2019/44, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3414401.

15. For an insightful discussion of the perils of entities-based regulation for policing systemic risk, see Jeremy C. Kress, Patricia A. McCoy & Daniel Schwarcz, *Regulating Entities and Activities: Complementary Approaches to Nonbank Systemic Risk*, 92 S. CAL. L. REV. (forthcoming 2019).

16. For an insightful characterization of these problems as an irreconcilable trilemma, see Bummer & Yadav, *supra* note 3.

17. See Van Loo, *supra* note 3, at 239.

18. For an overview of the overlapping system of federal and state oversight of marketplace lending, see DAVID W. PERKINS, CONG. RESEARCH SERV., R44614, MARKETPLACE LENDING: FINTECH

attempt to gain control over fintech firm activities as a result of their contractual relationships with regulated firms.¹⁹ As the regulated entities must be attentive to supervisory concerns, there are a variety of ways in which public officials can leverage that influence into indirect control over fintech entrepreneurs.²⁰ For example, recent efforts to define the ways in which regulated securities firms can maintain custody arrangements for cryptocurrencies can be seen as an effort on the part of government actors to establish some degree of supervisory oversight of cryptocurrencies beyond their direct control.²¹

In addition, if the manipulation of regulatory perimeters becomes too blatant, the legal system has ways of counteracting innovations that appear egregious. Several courts, for example, have disregarded interest-rate terms set through rent-a-charter arrangements when the practices seemed especially abusive.²² Similarly, the Federal Reserve Board has been reluctant to admit into the payment system a new bank charter whose entire business plan was based on giving unregulated third parties the functional equivalent of access to interest bearing accounts at Federal Reserve Banks.²³ So, there are limits on the extent to which fintech firms can contract into

IN CONSUMER AND SMALL-BUSINESS LENDING 12-22 (2018), <https://fas.org/sgp/crs/misc/R44614.pdf> [perma.cc/AJC8-6YFS].

19. For example, the Bank Service Corporation Act has been interpreted to provide federal agencies the authority to obtain information with respect to, and in some instances actually examine, fintech firms providing important services to regulated entities. See Fed. Deposit Ins. Corp., FIL-19-2019, Financial Institution Letter on Technology Service Provider Contracts (Apr. 2, 2019), <https://www.fdic.gov/news/news/financial/2019/fil19019.pdf> [perma.cc/NWD9-K6BR].

20. See BARR, JACKSON & TAHYAR, *supra* note 6, at 216-21 (exploring other instances in which regulatory officials used supervisory authority to constrain the activities of regulated firms).

21. See sources cited *supra* note 13. See also Inv. Co. Inst. & Sec. Indus. & Fin. Mkts. Ass'n, SEC Interpretive Letter (Jan. 18, 2018), <https://www.sec.gov/divisions/investment/noaction/2018/cryptocurrency-011818.htm>. [https://perma.cc/L7ML-VE3V] (exploring custody and other regulatory aspects of cryptocurrency holdings in investment funds).

22. For a critical overview of the principal legal cases setting aside efforts of lenders to contract out of usury limits, see DAVIS POLK & WARDWELL LLP, FEDERAL BANKING REGULATORS CAN AND SHOULD RESOLVE MADDEN AND TRUE LENDER DEVELOPMENTS (Aug. 14, 2018), https://www.davispolk.com/files/madden-true-lender-federal-regulatory-fix-whitepaper_final.pdf [https://perma.cc/6FRC-AGQJ].

23. See Carolyn Duren & Rucha Khole, 'Narrow Bank' Challenges Traditional Industry Model, *But Fed Pushes Back*, S&P GLOBAL MKT. INTELLIGENCE (Mar. 27, 2019), <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/49204495> [https://perma.cc/JYQ6-K2EN].

key financial functions. But with a very large number of existing banks and other kinds of financial firms available to provide a port of entry, there are ample opportunities for fintech firms with a new way of managing uncertainty or accessing customers to find a regulated entity willing to partner up for a modest fee.²⁴

Sometimes, regulators have a hard time even realizing that a regulatory perimeter has been breached. Here, the rise of robo-advisers offers an object lesson.²⁵ Robo-advisers are typically organized as broker-dealers and investment advisers under the supervision of the Securities and Exchange Commission (SEC), Financial Industry Regulator Authority (FINRA), and in certain respects state securities officials. Robo-advisers use investment algorithms to invest client assets in regulated mutual funds, including exchange-traded funds (ETFs), based on a limited number of characteristics, such as risk-return preference, investment period, and tax status. Robo-advisers are subject to regulation, but a relatively lax form that consists primarily of open-ended fiduciary duties and soft disclosure standards. The product that robo-advisers offer, however, is functionally quite similar to “fund-of-funds” mutual funds, which are subject to much more stringent regulatory requirements, including independent board oversight, well-defined disclosure rules about performance and fees, plus stringent portfolio restrictions. Robo-advisers replicate mutual fund activities through a combination of algorithmic models and client agreements. While they contract into the mutual fund industry for their underlying investments, their outer wrappers (and associated fee arrangements and disclosure requirements) are substantially different than those imposed on functionally similar fund-of-fund mutual funds. To date, robo-advisors arguably constitute a successful illustration of regulatory arbitrage.

24. Cf. Jeremy Kidd, *Fintech Antidote for Rent-Seeking?*, 93 CHI.-KENT L. REV. 165 (2018) (envisioning the rise of fintech firms as having the potential for reducing rent-seeking in the financial service industry).

25. The points made in this paragraph are elaborated upon in Howell E. Jackson, *Limits of Fiduciary Protections for Investors in Mutual Funds and Other Collective Investment Vehicles*, in FIDUCIARY OBLIGATIONS IN BUSINESS (Arthur Laby & Jacob H. Russell, eds., Cambridge Univ. Press, forthcoming 2020) (on file with the author).

IV. EXPLOITING THE POTENTIAL OF FINTECH FOR PUBLIC PURPOSES

While it is easy—and perhaps natural for a law professor—to focus on the extent to which fintech innovations pose challenges to regulatory regimes, fintech and its ability to reduce transaction costs and expand the range of contractual options also can offer possibilities to promote the public interest. I offer here a brief account of two examples: one ongoing and one hypothetical.

A. Emergency Savings in the Workplace

One of the greatest sources of financial vulnerability for low- and moderate-income individuals is the absence of emergency savings. To invoke an oft-quoted statistic, some nearly forty percent of Americans do not have immediate access to four hundred dollars of funds in the event of an emergency need.²⁶ Much regulatory effort has gone into policing abusive short-term lending practices, like some payday lending programs, to address a consequence of the absence of meaningful emergency savings, but another more direct solution would be to increase emergency savings balances. A good place to start such an effort is with major employers with large numbers of low- and moderate-income employees.²⁷ For the most part, these employers are not financial institutions and, while they may offer various kinds of fringe benefits (like health care and retirement savings plans), emergency savings is not yet typically on the menu of most employee benefit plans. There are, however, a number of fintech firms that provide a range of linkages between employer payrolls and regulated emergency savings vehicles. One could easily imagine a combination of

26. See BD. OF GOVERNORS OF THE FED. RESERVE SYS., REPORT ON THE ECONOMIC WELL-BEING OF U.S. HOUSEHOLDS IN 2018 21-22 (May 2019), <https://www.federalreserve.gov/publications/files/2018-report-economic-well-being-us-households-201905.pdf>, [<https://perma.cc/829Y-LFPU>].

27. The concepts presented in this paragraph are illustrated by a recent initiative, funded by BlackRock, to promote emergency savings. See BLACKROCK'S EMERGENCY SAVINGS INITIATIVE, <https://savingsproject.org/> [<https://perma.cc/R2PZ-A96K>]. The role of fintech firms in the implementation of this strategy is the subject of a forthcoming Harvard Law School case study. Adam Spiegel & Howell Jackson, Employee Benefits – Emergency Savings Account (draft of November 2019) (on file with author; to be published at <https://casestudies.law.harvard.edu/howell-e-jackson/>).

nonprofit leadership with limited government support to promote fintech linkages and employer nudges to steer workers into emergency savings programs. Here, fintech firms might exploit technological innovations to accumulate funds in a manner that has proven unprofitable and therefore unattractive to regulated firms operating on their own.

B. Safe, Low-Cost Accounts for the Unbanked

Finding safe and cost-effective savings vehicles for other unbanked individuals poses a related problem that may also allow a fintech solution. Many kinds of depository institutions operating in the United States today have historical roots in efforts to promote savings among working Americans: savings banks, thrifts, and credit unions all share these common roots. And recent efforts to revive a U.S. Postal Bank also are rooted, at least in part, on the view that such a bank would provide increased access to savings for the presently unbanked.²⁸ But all of these approaches are entity-centric and focus on the creation of a well-motivated legal entity to issue deposits to underserved communities and reinvest those assets through the entity's own balance sheet.

However, it is entirely possible to create safe savings without the balance sheet of a new legal entity.²⁹ The U.S. Treasury issues trillions of dollars of safe assets each year. Even putting aside the large volumes held on the Federal Reserve's balance sheet, there are ample Treasuries available for public purchase in a variety of maturities. There is even an internet portal—Treasury Direct—where the general public can purchase Treasuries directly, albeit with an interface that is currently quite clunky.³⁰ One could

28. See MEHRSA BARADARAN, *HOW THE OTHER HALF BANKS: EXCLUSION, EXPLOITATION, AND THE THREAT TO DEMOCRACY* 183-225 (Harvard Univ. Press 2015); see also Mehrsa Baradaran, *It's Time for Postal Banking*, 127 HARV. L. REV. F. 165 (2014); Mehrsa Baradaran, *How the Poor Got Cut out of Banking*, 62 EMORY L.J. 483 (2013).

29. See Commonwealth, *Increasing Access to U.S. Savings Bonds: Recommendations for Bond Innovations* (Dec. 9, 2016). The legal issues summarized in this paragraph are presented more fully in a Memorandum from Kathleen Shelton, Harvard Law Sch. Class of 2018, to Howell Jackson (Mar. 16, 2017) (on file with author). The adaptation of the Treasury Direct Program in this manner is functionally similar to The Narrow Bank approach discussed above, see *supra* text accompanying note 23, albeit targeted at low- and moderate-income individuals in need of a safe saving vehicle rather than the wholesale institutional market.

30. See *Guided Tour*, TREASURYDIRECT, <https://www.treasurydirect.gov/indiv/TDTour/default.htm> [<https://perma.cc/K4W3-CRAD>].

easily imagine, however, a refreshed Treasury Direct portal, supported through open-access APIs that would allow fintech firms to market safe savings products to a range of consumers. The Treasury Department already has statutory authority to adjust the terms of Treasury securities to accommodate such a program. And, to appease industry resistance, the size of permissible balances could be set at a level to avoid competition with private firms, just as the Obama Administration did with its now terminated myRA program.³¹ The product would solely be targeted at customers with account balances beneath commercially viable levels. Fintech entrepreneurs would provide all of the necessarily linkages, including (perhaps) offloading programs to private banks when Treasury accounts reach high enough balances.

V. ON DISCRETION & INTENTIONALITY

In *The Nature of the Firm*, Professor Coase identified managerial discretion as a critical strength of the firm and a principal justification for moving activities away from market transactions and into firm control. But fintech and most especially the emergence of artificial intelligence based on machine learning offer new ways of organizing activities within the firm but outside the control of managerial discretion, at least as the concept has traditionally been understood. This phenomenon has many important implications—among other things, for personal privacy and intellectual property³²—but the one that I want to explore here concerns state-of-mind requirements in various legal regimes. In many contexts, legal liability turns on the state of mind of a legal actor, requiring in some cases a showing of negligence and in others a finding of intentionality. Much of the first-year law school curriculum and a fair bit of jurisprudence explores the justifications for different state of mind requirements, but—put crudely—

31. See Richard Eisenberg, *R.I.P. myRA Retirement Account, Gone Too Soon*, *Forbes* (July 28, 2017), <https://www.forbes.com/sites/nextavenue/2017/07/28/r-i-p-myra-retirement-account-gone-too-soon/#73c1db0a7885> [<https://perma.cc/KB5G-DP6Y>].

32. For an overview of the issues with an emphasis on financial stability, see FINANCIAL STABILITY BOARD, *ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN FINANCIAL SERVICES: MARKET DEVELOPMENTS AND FINANCIAL STABILITY IMPLICATIONS* (2017). See also William Magnuson, *Artificial Financial Intelligence*, *HARV. BUS. L. REV.* (forthcoming 2020) (available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3403712).

the law tends to impose intentionality requirements when the social desirability of some activity is ambiguous and doctrine has evolved to limit liability to those cases where the likelihood of social harm is greatest and the culpability of the defendant clearest. With artificial intelligence, however, firms now have the opportunity to move activities away from the kinds of discretionary management that can give rise to a finding of human intentionality and into the domain of machine learning, where the concept of intentionality becomes opaque if not evanescent.³³

A. Market Manipulation and High-Frequency Trading

A good example of this phenomenon can be seen in the area of market manipulation and high-frequency trading (HFT). One potential concern with high-frequency trading is that its trading practices are often reminiscent of traditional forms of manipulation.³⁴ For example, HFT strategies often entail the posting of large numbers of trade orders, the vast majority of which are withdrawn before execution. This practice could be seen as analogous to fictitious trading proscribed under traditional market manipulation doctrine. Another example would be trading strategies in which HFT firms detect the presence of large “buy” orders—typically from institutional investors—and then seek to place orders ahead of the institutional buyer, pushing prices away from the large purchaser and allowing the HFT trader to earn quick profits by placing itself between the orders in the marketplace. In certain respects, this practice is analogous to front-running.³⁵

A robust and insightful body of academic literature and policy papers have recently explored the question as to how traditional anti-manipulation rules should be applied to these new concepts. One component of this literature is an examination of how intentionality—traditionally a key

33. *But cf.* Enriques & Zetzsche, *supra* note 1 (emphasizing the challenges in delegating discretion to algorithms in the context of corporate governance).

34. For a good overview of the differences between old manipulation practices and new manipulation practices, see Tom C.W. Lin, *The New Market Manipulation*, 66 EMORY L.J. 1253, 1280-94 (2017).

35. See Alan Chan, *Do High Frequency Traders Front-Run the Market by Using Their Speed Advantage?*, FORBES (Apr. 3, 2014, 1:41 P.M.), <https://www.forbes.com/sites/quora/2014/04/03/do-high-frequency-traders-front-run-the-market-by-using-their-speed-advantage/#4c0442fb25a0> [<https://perma.cc/548V-CD62>].

element of manipulation cases—should be applied in these concepts where human intentionality is not directly at issue in the trading, but arguably something akin to intentionality might be found in the design of the code that supports the trade.³⁶ Of course, to the extent the HFT trading algorithms have their own elements of machine learning, it is quite easy to imagine the algorithms themselves developing trading practices wholly unanticipated by the humans that generated the underlying code in the first place.

B. Artificial Intelligence and the Enforcement of Fair Lending Rules

Another example of this phenomenon occurs in the area of antidiscrimination law defining the boundaries of fair lending practices. Traditionally, the Equal Credit Opportunity Act (ECOA) and related antidiscrimination laws prohibit discrimination in lending through a doctrinal structure that includes a combination of disparate treatment and disparate impact analysis.³⁷ The doctrines that evolved in this area look to whether a lending firm intentionally discriminated on the basis of protected characteristics (such as race), or made use of factors that had a disparate impact on protected groups without there being a legitimate business justification for the lender's underwriting practices. Cases arising under these provisions often turn on the state of mind of the lender for both intentional use of race and business justifications for the use of other factors.³⁸

Increasingly, lenders today, and most particularly many fintech lenders, rely on algorithms and machine learning to make credit decisions. In this context as well, the use of algorithms does not easily map on to traditional

36. For an overview of sources on this topic, see Lin, *supra* note 34, at 1300-03. *See also id.* at 1303-06 (advocating intermediary integrity obligations as an alternative approach); Merritt B. Fox & Kevin S. Haeberle, *Evaluating Stock-Trading Practices and Their Regulation*, 42 J. CORP. L. 887 (2017) (advocating that legal doctrine focus on the second market impact of trading practices). For a more general, but still quite helpful, proposal for the analysis of manipulation, see Merritt B. Fox, Lawrence R. Glossten & Gabriel V. Rauterberg, *Stock Market Manipulation and its Regulation*, 35 YALE J. ON REG. 67 (2018).

37. *See* Equal Credit Opportunity Act, 15 U.S.C. §§ 1691-1691f (2018).

38. *See, e.g.,* Anderson v. Wachovia Mortg. Corp., 621 F.3d 261, 269-79 (3d Cir. 2010) (performing detailed analysis of alleged intentional discrimination and business justifications); Golden v. City of Columbus, 404 F.3d 950, 963-65 (6th Cir. 2005) (affirming dismissal of ECOA disparate-impact claim regarding utility fees, in part relying on legitimate business justification that measuring unit-by-unit consumption was impracticable).

doctrinal test of intentionality and, as my colleague Talia Gillis has explored in several recent articles, advanced machine learning techniques seek to find variables correlated with creditworthiness and profitability, acting without the intervention of any human state of mind or discretionary authority to make pricing or credit allocation decisions.³⁹ One of the great debates of consumer financial regulation today is how to align these new lending practices with traditional fair lending doctrine.

To put these two examples into the Coasean framework, underwriting decisions and trading strategies were typically organized within the operations of a regulated firm because of the advantages of delegating to expert personnel the discretion to decide to whom to make loans or by which trading strategies to execute transactions. While lending algorithms and HFT strategies may formally remain within the regulated firm, the discretionary component and also the possibility of ascertaining human intentionality have disappeared. Traditional legal doctrines are incapable of providing relief unless regulatory officials devise new approaches to enforcement and detection. Efforts of these sorts are underway, but for the purposes of this essay the need for such refinement legal doctrines is further evidence that fintech innovations are challenging the boundaries of regulated firm behavior.

CONCLUSION

The boundaries of the firm are constantly in flux, and the rise of fintech innovation only adds to the pace of change. Unregulated fintech firms can tap into the regulatory perimeter to gain access to essential regulated services, and regulated firms can push out to fintech entrepreneurs activities that may generate regulatory concerns or compliance costs. And fintech products can transform the ways in which managerial discretion is exercised, further complicating the detection and prosecution of violations of financial laws. Many of these developments likely have considerable benefits for society through improved efficiencies and more effective detecting and spreading of financial risks. But if regulatory officials remain

39. See Talia Gillis, *False Dreams of Algorithmic Fairness: The Case of Credit Pricing* (Working Draft of Sept. 26, 2019) (available at <https://scholar.harvard.edu/gillis/job-talk-paper>); see also Talia B. Gillis & Jann L. Spiess, *Big Data and Discrimination*, 86 U. CHI. L. REV. 459 (2019).

flat-footed, these developments can cause breaches in the regulatory perimeter and under-enforcement of financial laws and considerable social harms. It is the nature of the fintech firm to disrupt past regulatory paradigms and practices.