Gamification and securities regulation

James Fallows Tierney

Popular zero-commission stock trading apps like Robinhood innovate in user-experience design, featuring gamification practices—flashy graphics, leaderboards, and the like—that make it attractive, easy, and fun to trade stocks. Regulators are increasingly scrutinizing these “digital engagement practices” with efforts underway at the SEC to adopt rules in broker-dealer and investment-advisor regulation. This attention reflects considerable skepticism about behavioral design in securities markets. At best, these practices encourage motivation and engagement, and democratize access to financial markets. But at worst, these practices may encourage socially wasteful (and individually harmful) excessive trading, as well as market-wide effects like lower quality price discovery and distortions in capital allocation. And given that interventions in retail investor choice have significant implications for wealth inequality, regulatory responses here are a high-stakes matter not just for retail investors and their brokers, but also for society more broadly.

Calls to regulate gamification highlight a tension at the core of securities markets. Securities law has largely ceded the field of investor protection to the interests of sophisticated financial intermediaries in producing liquidity and price discovery. By permitting gamification practices that encourage active trading for the broker-dealer’s primary benefit, securities law subordinates its investor protection function to encourage plausibly wasteful investment in achieving ever-smaller improvements in liquidity and price discovery. Regulatory intervention would be socially desirable, I argue, not just given what we know about retail trader behavior and its second-order effects on personal finance and markets—but because it is an opportunity for securities law to recalibrate away from an all-out arms race in arbitrage.

This article takes up the problem of gamification and related digital engagement practices. It considers how gamification is the nearly inevitable consequence of fragmented market structure, competition on brokerage commissions, and the rise of retail investors who trade without superior information about a stock’s fundamental value. Yet calls for regulatory interventions often elide important distinctions between how securities law should treat active-traders who prefer risk, and those with preferences distorted by behavioral design. This article explains how we got here; examines the social-welfare case for regulating gamification, behavioral design, and related digital engagement practices; offers a typology of techniques that securities regulators can adopt in response; and assesses these interventions against existing securities law doctrine and policy. I also consider the criticisms and defenses by

---

1 Assistant professor of law, University of Nebraska College of Law. Draft dated December 15, 2021; current draft at https://www.ssrn.com/abstract=3916407. Comments welcome at jtierney4 [at] unl.edu. For helpful conversations, I thank Nicholas Almendares, Steve Bradford, Josh Braver, Jacob Bronshter, Jake Charles, Jill Fisch, Brian L. Frye, Gina-Gail Fletcher, George Georgiev, Talia Gillis, Alan Kluegel, Guha Krishnamurthi, Kyle Langvardt, Don Langevoort, Jamie Liebentritt, Da Lin, William Magnuson, Geeyoung Min, Lidiya Mishchenko, Alex Platt, Shalev Roisman, Barbara Roper, Steve Schaus, Justin Simard, David Simon, Will Thomas; as well as organizers and participants at the National Business Law Scholars Conference, Chicagoland Junior Scholars Conference, Consumer Federation of America conference, the University of Kentucky J. David Rosenberg College of Law faculty colloquium, and at the Junior Scholar Workshop Series and Research Accountability Group workshops. Special thanks to Lauren Brown, Casey Dodge, Taylor Kuhlman, and Cal Thomas for superlative research assistance. This article was made possible, in part, by a McCollum summer research grant, and by viewers like you.
techno-optimists, -pessimists, and -populists about the broader effects of gamification on how retail investors engage with financial markets.

INTRODUCTION .................................................................................................................. 3

I. GAMIFICATION IN SECURITIES MARKETS ................................................................ 8
   A. Design to influence our behavior ........................................................................... 8
   B. Gamification as object of regulatory scrutiny ...................................................... 13
   C. The emergence of behavioral design ...................................................................... 15
      1. “Re-retailization” in securities markets .......................................................... 16
      2. Competition and innovation ............................................................................ 19
      3. Market fragmentation and intermediation ....................................................... 21

II. DILEMMAS OF REGULATING BEHAVIORAL DESIGN IN RETAIL INVESTMENT MARKETS ........................................................................................................... 24
   A. Theoretical and empirical models of retail trader decisionmaking ................ 25
      1. Risk preferences and consumption of nonpecuniary benefits. ................. 25
      2. Attention-induced noise trading ................................................................. 27
      3. Dark patterns, habit forming technology, and choice distortion............ 30
   B. Situating behavioral design within securities law theory .............................. 31
      1. Agency costs in brokerage and investor protection ................................. 31
      2. Excessive noise trading and the gambling analogy .................................. 35

III. WHETHER AND HOW TO REGULATE BEHAVIORAL DESIGN? ................ 39
   A. The social costs of behavioral design in retail investment markets .......... 39
      1. Loss and waste .............................................................................................. 39
      2. Distribution in the brokerage agency relationship ...................................... 41
      3. External harms to markets and capital allocation ..................................... 43
   B. Undesirable or impractical regulatory interventions ..................................... 46
      1. The false promise of mandatory disclosure solutions ............................ 46
      2. Mandatory downtime and other behavioral interventions .................... 47
      3. Counter-addictive design ............................................................................ 49
      4. Ban on dangerous features: “Confetti regulation” .................................. 51
      5. Ban on dangerous features: “Excessive trading” theories ....................... 51
   C. More realistic regulatory interventions ............................................................... 52
      1. Fiduciary-duty theories .............................................................................. 52
      2. Regulation Best Interest and “behavioral churning.” ............................. 55
      3. Gatekeeping, supervisory, and compliance .............................................. 59
      4. Market structure interventions .................................................................. 59

IV. NORMATIVE AND THEORETICAL IMPLICATIONS ............................................. 60
   A. Techno-skepticism: access and confidence in ludic capitalism .................. 61
   B. Techno-populism and the democratization of finance ................................. 63
   C. Techno-optimism and gamification as investor education ............................. 66
   D. Price discovery, liquidity, and the ends of securities regulation ................ 69

CONCLUSION .................................................................................................................... 72
INTRODUCTION

2021 might have been the year of the retail trader.\(^2\) Retail traders piled into meme stocks like GameStop and other risky assets like crypto and options, launching asset prices like “rockets to the moon.”\(^3\) Popular stock brokerage apps like Robinhood not only made active trading cheap, easy, and fun; they encouraged it.\(^4\) Legal scholars have celebrated the re-emergence of retail investors as a force in stock markets, reversing long-term trends.\(^5\)

This airy story, resonant with overtones of the democratization of finance, obscures two somber truths about today’s stock market. First, ordinary people don’t heed the advice of traditional finance: invest patiently in a diversified, risk-adjusted portfolio. Many try to beat the market by trading stocks. Yet decades of research reveals that retail investors buy and sell too much and that “trading is hazardous to your wealth.”\(^6\) The second somber reality is that brokers have strong incentives to encourage retail customers to engage in self-directed trades that are either excessive or in securities that are unsuitable for them.\(^7\) Between market innovations like zero commission trading, fractional share investing, and attractive user interface design, it is cheaper and easier than ever before for ordinary people to trade securities and financial products.

Yet regulators now worry that trading is too easy. What to do about it is a concern for broker-dealer regulation, a subfield of securities law.\(^8\) Much of the regulatory worry has focused on Robinhood, a prominent zero-commission brokerage app.\(^9\) In the

---


\(^{3}\) See, e.g., Katherine Doherty & Brandon Kochkodin, AMC Became the People’s Stock by Not Being a GameStop Remake, BLOOMBERG BUSINESSWEEK (Jun. 4, 2021), https://perma.cc/486X-EZVW (describing meme stocks and “rockets to the moon”).


\(^{5}\) See Id. at __; Jill Fisch, Gamestop and the Resurgence of the Retail Investor (presentation at NBLSC, June 2021).


\(^{7}\) See infra Parts I and II.B.1.


\(^{9}\) See, e.g., Michael Wursthorn & Euirim Choi, Does Robinhood Make It Too Easy to Trade? From Free Stocks to Confetti?, WALL ST. J. (Aug. 20, 2020). For other examples, see Misyrlena Egkolfopoulou et al., How Robinhood Made Trading Easy — and Maybe Even Too Hard to Resist, BLOOMBERG BUSINESSWEEK (Apr. 2021); Hannah Levintova, Robinhood Promises Free Trades.
market for zero-commission brokerage, mobile app developers have innovated in user-interface design to compete with incumbent brokers. Robinhood, for instance, used to shower digital confetti down a smartphone screen upon successful execution of a trade. Other innovations have included not just intuitive and appealing design, but digital engagement practices that encourage users to interact with the app and that shape the information they consider in deciding whether to make trades. Specific examples include leaderboards of stocks that are volatile or popular with other users, push notifications that prompt users to trade, and lotteries and other variable rewards.

The title of this paper uses the term “gamification,” which was a bit of an engagement practice itself. In financial advisory apps, we might call these gamification practices “behavioral design,” which fit within a broader category of regulatory concern: “digital engagement practices.”

Did Alex Kearns Pay With His Life?, MOTHER JONES (Apr. 29, 2021), at __, https://www.motherjones.com/politics/2021/04/robinhood-gamestop-free-trades-alex-kearns/; Annie Massa & Sarah Ponczek, Robinhood’s Addictive App Made Trading a Pandemic Pastime, BLOOMBERG BUSINESSWEEK (Oct. 22, 2020), https://perma.cc/G62Y-EHUT; Robin Wigglesworth et al., The Lockdown Death of a 20-Year-Old Day Trader, FINANCIAL TIMES (Jul. 1, 2020), https://www.ft.com/content/45d0a047-360f-4abf-86ee-108f436015a1. This article is not a brief against Robinhood, where I have a brokerage account. I address Robinhood because it is a highly salient example of a publicly traded, formerly-unicorn broker-dealer with large market share having been subject to media and regulatory scrutiny.


See infra note 43.

See infra Part I.A.

Thanks for reading.

The SEC has issued a request for information, see infra notes 55-58, on the regulation of digital engagement practices. See, e.g., Request for Information and Comments on Broker-Dealer and Investment Adviser Digital Engagement Practices, Exchange Act Release 92766, 86 Fed. Reg. 49067 49068 (Sep. 1, 2021) (“DEP RFI”). Digital engagement practices is a broader concept that ranges from electronic communications to roboadvice, and from securities screening tools to retirement contribution planners. The concept also includes second-order practices like data analytics, personalized recommendation algorithms, and A/B testing that allow monitoring, testing, and fine-tuning the efficacy of these design practices. I don’t write about “digital engagement practices” here because a full treatment would require a book. It plausibly covers any kind of sales or advisory practice that brokers, dealers, registered investment advisers, and their associated people use through electronic means, directly or indirectly. In my view, the regulatory concerns associated with behavioral design targeted at excessive trading are very different from those with using digital engagement to encourage responsible financial behavior (such as roboadvice) or financial literacy. Cf. infra Part IV.C.
design is a familiar feature of our online world. These practices reward, motivate, or engage us in some task to encourage responses we would not otherwise make.

The concern is that effective behavioral design stimulates and encourages engagement with the app. When effective, it elicits a higher volume of noisy retail order flow in securities that generate brokerage profits and cross-subsidize further trading. Recent empirical research has shown how design can shape trading behavior in ways that are profitable for the broker, may not be in retail traders’ interests, and may have downstream negative consequences on market quality. Encouraging excessive trading also has significant implications for wealth inequality, which is partly a function of how securities law shapes ordinary people’s ability to reliably grow wealth by participating in capital markets.

To that end, behavioral design practices have come under increased regulatory scrutiny. Congress held a series of hearings in early 2021 to discuss the role of retail traders in stock markets, directly scrutinizing gamification. Federal and state regulators have announced responses across the range of rulemaking, enforcement, and examination. The SEC, for instance, has requested information from the public about DEPs and possible regulatory interventions, signaling that the issue is a priority and work is underway. This regulatory attention reflects considerable skepticism about behavioral design in securities markets. Cast in the best light, behavioral design can encourage engagement, motivate investor education efforts, and even democratize access to markets. At worst, it may encourage socially wasteful and potentially individually harmful excessive trading and idiosyncratic losses—to say nothing of higher volatility and lower quality price discovery, as well as distortions in capital markets that have undesirable practical and expressive effects. Regulatory interventions in retail investor choice have significant implications for wealth inequality, making them a high-stakes matter not just for retail investors and brokers, but for society more broadly.


16 See infra Parts II.A and III.A.

17 See, e.g., Emily Winston, Unequal Investment: A Regulatory Case Study, CORNELL L. REV. __ (2021); see also infra notes 75-77 and Parts IV.A and .B.

18 See infra Part I.B.

19 See infra text accompanying notes 51-58.
Securities law does not have a readymade theory for trading off these concerns. That underscores the urgent need for scholarship situating these practices in theory and doctrine. Despite a rich literature on regulation of retail investment markets, legal scholars have largely overlooked the regulation of innovative technologies that direct and channel retail traders’ attention and shape their decisions. This Article fills that gap, articulating from the ground up a theory of behavioral design in securities regulation.

Behavioral design, and calls to regulate it, highlight a tension at the core of securities markets. Investing is an essential way of growing wealth in a capitalist economy, and securities law expresses a normative commitment toward protecting investors. Yet modern securities law has largely ceded the field of investor protection to the sectoral interests of sophisticated financial intermediaries in the guise of producing two quasi-public goods: liquidity and price discovery. Capital markets regulation has, since the beginning, been oriented toward production of those two goods, as well as about division between brokers and clients of the surplus from trading.

---

20 “Securities law” is meaningful here in one sense but not another. Brokerage apps sometimes let customers trade cryptocurrencies like Bitcoin, Ethereum, and Dogecoin. The elephant in the room is the regulatory status of these and other cryptocurrencies. The markets are similar, dealers earn similar sorts of intermediation rents, and as a practical matter many of the apps of regulatory concern have a great bulk of revenue coming from crypto transaction volume. In the Form S-1 registration statement filed in connection with its IPO, Robinhood warned prospective investors that cryptocurrency demand is a material risk for investors given the share of revenue attributable to transaction volume in Dogecoin.


22 Other than Packin’s article, the closest legal scholars in this area have come is examine how securities law conceives of the ways that principles of behavioral economics such as choice architecture bear on retail investor behavior. For instance, Jacob Hale Russell has surveyed the theoretical and empirical literature on why retail investors trade excessively, and distinguished the normative basis for regulatory intervention based on whether the reasons are taste or circumstance based. See Jacob Hale Russell, Misbehavioral Law and Economics, 51 U. Mich. J. L. Reform 549, __ (2018). Russell does not, however, address the phenomenon, regulation, or theory of gamification in broker-dealer regulation. And because he wrote before trading commissions largely dropped to zero in late 2019, cf. infra note 91, some prescriptions are based on factual assumptions that no longer hold.

23 In a short essay, Kyle Langvardt and I briefly discussed the problem of gamification, focusing on first-party problem-use harms and a ban on gamification as a highly salient regulatory response. We wrote to highlight the administrability and litigation risk associated with such a ban, but explicitly left open the higher-order theoretical, doctrinal, and normative questions that this article addresses. Langvardt & Tierney, supra note 15, at __.
securities. How to regulate behavioral design, then, is the most recent fault line in this long running process of contestation over legal rules that purport to divide that surplus in particular ways.

Behavioral design encourages people to trade excessively in an otherwise apparently self-directed account. In a short essay in the *Yale Law Journal Forum*, Kyle Langvardt and I described this as “behavioral churning.” By encouraging retail traders to engage in risky bets that underperform the market on average, all for the broker-dealer’s benefit, securities law subordinates its “investor protection” function to its liquidity and price discovery functions—twin altars at which retail traders are encouraged to sacrifice themselves. What to do with behavioral design is thus a high-stakes matter not just for retail investors but for society more broadly.

The rest of the article proceeds like this. Part I introduces our subject, identifies emergent regulatory responses, and situates behavioral design as the product of several convergent trends in law and market structure. Part II turns to the article’s first claim: our assessment of how securities regulation should handle behavioral design is a function of our models of retail investor behavior. I situate behavioral design within existing empirical and theoretical models for why ordinary people actively trade, as well as securities law theory on retail trader participation in securities markets.

I then turn to doctrinal and normative implications. Drawing from literatures on regulation in response to imperfect rationality and habit forming technologies, Part III identifies several market failures arising from behavioral design—some principal-agent problems and externalities—that offer a basis for regulation. I examine several unattractive doctrinal responses, like disclosure, mandatory downtime, and transactional frictions. I turn to some better options, such as fiduciary theories, building out existing doctrinal tools, and reforming the market structure incentives that give rise to behavioral design. The SEC has many of the tools it needs to address behavioral design features that encourage noisy order flow, given that quantitative suitability duties apply even in self-directed accounts whenever a broker makes a recommendation. I address some doctrinal fixes around the edges and explain why the SEC should not—as the brokerage bar suggests—leave existing law alone. I also sketch out some more ambitious market structure reforms.

---

25 See infra notes __.
26 Langvardt & Tierney, *supra* note 15, at __.
Finally, Part IV offers normative takeaways. I address techno-optimist claims that behavioral design can promote financial literacy, techno-populist claims about democratizing investing and corporate governance, and techno-pessimist claims about games undermining our confidence in markets. I close with some observations on how behavioral design is the product of underlying market failures, and that the boldest and most modern approach would be for securities law to step in to fix them.

I. Gamification in Securities Markets

Retail investors must decide which broker to use, and then transactions to make. To compete for digitally savvy clients, brokers have bid commissions down to zero and adopted attractive user interface design. Then, once clients have opened accounts, brokers also use design to influence the securities that clients buy, sell, and hold. In digitally mediated transactions, user interfaces and experiences are often designed to appeal to our psychology to elicit desired behaviors. Firms may control user flow through a business process, like an online shopping cart. The design of these processes can shape or nudge user choice by presenting information and making options appear more attractive.

Part I introduces the problem of behavioral design, and suggests why brokers have incentives to influence trader behavior this way. After surveying regulatory scrutiny that these practices have elicited, I situate gamification as the product of three historical trends: price competition for brokerage commissions, the re-emergence of retail trading, and the role of noisy order flow in an increasingly fragmented market structure.

A. Design to influence our behavior

In our increasingly digitally mediated world, firms adopt practices that reward, motivate, or engage us to encourage decisions or actions we would not otherwise make or take. The choices people make may not reflect the actual benefits they will experience receiving, giving rise to an opportunity for firms to manipulate choice with plausible social harms.27

27 Some practices are commonly seen as objectionable, such as in the simple case where people are deceived into entering into transactions that they otherwise would not make. Other times, the normative analysis is more complex, as where there is no deception or the practice shifts economic surplus without inducing different transactions. See infra Part __; see, e.g., Michael D. Guttentag, Law and Surplus: Opportunities Missed, 2019 UTAH L. REV. 607, 658–60 (2019).
This kind of design feature might be called “behavioral design.” Some of the important elements are also sometimes called “gamification,” especially in the popular imagination. In the game studies literature, gamification refers to the presence of “game design elements in non-game contexts.” Across literatures bearing on gamification in design, a common thread focuses on how the presentation of information bears on the decisions people make. Behavioral design involves presenting information and choices about goods, services, transactions, and markets that appeal to imperfectly rational cognitive processes to elicit behavior that benefits the designer. Design can encourage intuitive, habitual, and uncritical responses rather than deliberation over preferences and choices.

These strategies are increasingly prevalent in business, education, and other fields. They offer an attractive proposition because it lets businesses appeal to predictably imperfect rationality

28 Scholars of economic transactions by ordinary people—in consumer law, contract law, securities law, and the like—have focused on behavioral exploitation. See Id. (reviewing literature); see, e.g., James Fallows Tierney, Contract Design in the Shadow of Regulation, 98 NEBRASKA LAW REVIEW 874, __ (2020); Martin Brenncke, The Legal Framework for Financial Advertising: Curbing Behavioural Exploitation, 3 EUR. BUS. ORG. L. REV. 1 (2018); OREN BARGILL, SEDUCTION BY CONTRACT (2012).


30 See, e.g., Sebastian Deterding, The Ambiguity of Games: Histories and Discourses of a Gameful World, in THE GAMEFUL WORLD: APPROACHES, ISSUES, APPLICATIONS 23, 40 (Steffen P. Walz & Sebastian Deterding eds., MIT Press 2015) (describing the idea that “behavioral economics [is] a foundation for gamification,” often used to frame investment in game design as a way to “help[] … marketers to drive … sales with choice architectures whose design patterns directly use cognitive biases and heuristics, social influence, emotional appeals, and the power of habit”). I prefer “behavioral design” to avoid some of the contestation and scholarly baggage associated with “gamification” as a term in literatures such as game studies, educational psychology, behavioral finance, and human-computer interface design. Is “behavioral exploitation” better? See supra note 28.

31 For instance, “dark patterns” are user interfaces that “nudge consumers toward a selection that is likely to be unpopular with them but profitable for the company,” like signing up for an autorenewing periodic subscription at a higher rate. Jamie Luguri & Lior Jacob Strahilevitz, Shining a Light on Dark Patterns, 13 J. LEGAL ANALYSIS 43, __ (2021).

of users in service of some goal, including private profit. For regulators and scholars alike, there is a common concern underlying concepts like dark patterns and habit-forming technology: that design distorts user behavior in ways that give rise to traditional market failures like principal agent problems and externalities, as well as objections to the distribution of economic surplus.

Scholars have shown the role of user interface design in encouraging repeat engagement with stock trading apps. One brokerage firm that has attracted significant attention is the developer of Robinhood, an app through which clients can trade stocks, ETFs, options, and cryptocurrencies. In a zero-commission world, firm profits scale relative to some alternative revenue source. If the revenue source relates to the volume of client flow, then firm profits scale relative to the amount of client engagement with the app and transactions effected. To that end, like other online brokers that compete for digitally savvy younger clients, Robinhood’s user experience incorporates behavioral design practices.

Some aspects of behavioral design may be benign or even useful, as in the case of design features that are meant to inform or educate clients. Others may be less benign, as in the cases of marketing or advertising communications, or of recommendations of securities. The rest of this subpart illustrates practices that may bear on promoting engagement and directing user attention to particular information.

Recommendation algorithms. Some brokers give clients lists of stocks to consider. These lists increase salience of certain stocks, like “top movers” with greatest percentile changes that day, stocks with high trading volume across the market or at the broker-dealer, or most concentrated holdings among clients. Some securities may be

---


34 See, e.g., Luguri & Strahilevitz, supra note 31, at ___; Gus Hurwitz, Designing a Pattern, Darkly, 22 N.C. J. L. & TECH. 57, 61–64 (2020); Langvardt & Tierney, supra note 15.


36 See Robinhood Markets, Inc., Registration Statement (Form S-1) (July 1, 2021).

37 See infra note 57.

more salient for reasons that are not apparent to an observer. In any case, these recommendation algorithms have a tendency to promote the salience of these securities among the potential choice set. This increased salience can induce demand, a phenomenon of attention-induced noise trading.

*Push notifications.* Some apps present users with brief messages on the screen upon the occurrence of some event, known as a push notification. Many push notifications are designed to encourage monitoring and trading, while others are informational and more benign.39

*Eye candy.* People sometimes use gamification to refer to “eye candy,” or aesthetically pleasing design. Robinhood’s signature piece of eye candy was digital confetti: upon completion of a first trade, confetti would rain down the screen, as seen in Figure 1 below.40 The firm’s early ads showed a young man, sitting at dinner looking at a phone, and reacting in surprise when the phone showers confetti over him.41 Confetti is not the most objectionable thing about gamification, but people do love to talk about it.42

![Figure 1: User flow during selection of variable reward, circa 2018](image)

*Surprise stock awards.* Robinhood offers users lotteries for potentially valuable surprise stocks as rewards for linking their bank

---

39 Langvardt & Tierney, *supra* note 15, at __.
41 See Wursthorn & Choi, *supra* note 9
42 Cf., e.g., James J. Angel, *Comment Letter on Digital Engagement Practices* 7 (2021) (“I miss the confetti.”).
accounts or referring new users. Figure 1 shows the flow of screens that a user would experience—three card monte, a scratch ticket, and a flurry of confetti—during the selection of a variable reward as of winter 2018. This reflects on its face a visual frame that calls to mind lottery-like phenomena, encouraging people to equate stock and crypto assets as having the potential to be “jackpots.”

Engagement devices. Traditional “gamification” features reward engagement for its own sake. Free-to-play apps often reward frequent engagers with preferential access to new features. Likewise, when Robinhood first launched, prospective users could engage with “a referral-based viral loop” to move up the waitlist by referring other prospective users. The firm offered a similar waitlist for a cash management product, using design features often seen in casino gaming machines to encourage repeated and habitual engagement to keep place on the waitlist.

Metaphorical gaming. There is finally a sense in which “gamification” denotes that easy-and-free trading, combined with expressive aspects of coordinating with other traders, makes a “game” of trading. Congressional committee staff, for instance, have suggested that meme stock trading might be a consequence of “the gamification of investing and … the increasing role that social media and technology play in capital markets.” Market commentator Matt Levine has explained that in this model Robinhood offers “in-app purchases” for which “you can end up spending a lot of money”: Candy Crush but with more at stake. And like with other games, it’s possible to pursue other expressive, performative, and “gameful” ends that don’t involve making

44 See Id.
45 George Vasiliadis, How Robinhood Got Nearly 1 Million Users Before the Company Even Existed, Viral Loops (Medium) (Nov. 23, 2017).
47 See, e.g., Chris Gullotti, Why I’m No Fan of Trading Apps That Treat Investing Like a Game, KIPLINGER (Feb. 24, 2021), https://www.kiplinger.com/investing/602326/why-im-no-fan-of-trading-apps-that-treat-investing-like-a-game. Gamification in this sense refers more broadly than my more limited definition of encouraging digitally intermediated microtransactions. Game studies scholar Sebastian Deterding, for instance, has evaluated the discourse of gamification focusing on online user experience design that appeals to cognitive psychology and behavioral economics, and distinguished this discourse from others that instead center expressive, performative, and other functions of the “gameful world.” Deterding, supra note 30, at 34–47.
48 Staff Memorandum on the Game Stopped Hearing 5, https://perma.cc/J7FM-J9JY.
money—like engaging in meme stock herding trades.\textsuperscript{49} According to one concern that I return to in Part IV.A, this may decrease public confidence in markets.

B. Gamification as object of regulatory scrutiny

Behavioral design has increasingly become an object of legislative and regulatory scrutiny. When zero-commission brokerage gained popularity in 2019, it quickly became apparent that behavioral design and digital engagement practices were driving growth—with potential for social harm.\textsuperscript{50} To that end, the Biden administration’s SEC Chairman, Gary Gensler, has made gamification a priority.\textsuperscript{51} Testifying before Congress in May 2021, Gensler criticized brokerage apps that use “psychological prompts to get people to trade more,” even though active trading “doesn’t mean better returns.”\textsuperscript{52} Since then, a majority of the Commission has expressed interest in regulating gamification.\textsuperscript{53} The two Republican-appointed Commissioners, Hester Peirce and Elad Roisman, have taken a more cautious public approach toward regulating gamification.\textsuperscript{54}

The particulars of the SEC’s response remain open-ended. The staff is considering various options for addressing these practices,

\textsuperscript{49} Matt Levine, \textit{Money Stuff: Playing the Game of Infinite Leverage}, BLOOMBERG OPINION (Nov. 5, 2019) (noting that modern retail trading might not just be about “conventional financial analysis,” but “impressing people with your wit and boldness” on social media). On “gameful” ends, see generally Deterding, \textit{supra} note 30.

\textsuperscript{50} David Ingram, \textit{Designed to Distract: Stock App Robinhood Nudges Users to Take Risks}, NBCNEWS.COM (Sep. 12, 2019), https://perma.cc/JGH7-6KNU.


\textsuperscript{54} See, e.g., Hester M. Peirce, \textit{Speech, Atomic Trading}, George Washington University Law School Regulating the Digital Economy Conference (Feb. 22, 2021) (defending gamification in capital markets and encouraging the Commission to “gamify” its own communications with investors); Dean Seal, \textit{SEC’s Roisman Wary Of Playing Into “Gamification” Fears}, LAW360 (Nov. 16, 2021). (expressing uncertainty about what “gamification” is but openness to examining the question, but urging an approach that emphasizes “consensus” in making “regulatory enhancements” to avoid getting the agency “mired in litigation”).
including the adequacy of existing securities laws and the possible need for “fresh” rules. In August 2021, the SEC published a request for information (RFI) related to these issues. The RFI focused on broker-dealer and investment adviser use of “digital engagement practices,” a term defined to “broadly include behavioral prompts, differential marketing, gamelike features, and other design elements or features designed to engage retail investors.” The agency has expressed interest in rulemaking that addresses digital engagement practices in the broker-dealer and registered investment adviser space.

Gamification has also attracted the attention of the Financial Industry Regulatory Authority (FINRA), the self-regulatory organization (SRO) for broker-dealers. FINRA makes and enforces rules for brokers, and it implements these by examining and monitoring its member brokerage firms for compliance and regulatory risk. FINRA notified members that it was scrutinizing compliance with rules on communications with clients in app-based investing platforms. FINRA noted the tradeoff between the

---


57 DEP RFI at 49068 (explaining that illustrative examples of DEPs might include “[s]ocial networking tools; games, streaks and other contests with prizes; points, badges, and leaderboards; notifications; celebrations for trading; visual cues; ideas presented at order placement and other curated lists or features; subscriptions and membership tiers; and chatbots”). Overlooking that this is a nonexclusive list, the securities defense bar seems to want to talk about these nine categories. See, e.g., Stephanie Nicolas & Kelley Dunbar, WilmerHale, SIFMA’s Digital Engagement Practices Webinar (Nov. 17, 2021).

58 Id. at ___.


61 See FINRA Rule 2210; FINRA, 2021 Report on FINRA’s Examination and Risk Monitoring Program 2, 20–22 (Feb. 2021) (explaining that FINRA was “increasingly focused” on “risks associated with app-based platforms with interactive or ‘game-like’ features that are intended to influence customers”). FINRA has also settled enforcement actions with zero-commission brokers for disclosure and best-execution violations related to receipt of payment of order flow and other issues arising from the underlying business model.
increased access to trading markets that digital platforms provide, and the possibility of “increased risks to customers if not designed with the appropriate compliance considerations in mind.” FINRA has continued to discuss responses to gamification and the business model.

State securities regulators also play a role in enforcing broker-dealers’ obligations under the securities laws. Massachusetts regulators have been boldest in pursuing gamification claims under state law. In administrative proceedings against Robinhood, Massachusetts has alleged that gamification violates state securities laws prohibiting broker-dealers from engaging in unethical practices, state fiduciary-duty rules, and state reasonable-supervision rules.

C. The emergence of behavioral design

Before tackling questions like whether securities law should intervene—and if so how—it’s worth considering the origins of behavioral design. As this subpart explains, behavioral design is a product of several convergent trends in retail stock markets: (1) the “re-retailization” of capital markets; (2) price competition on brokerage commissions; and (3) intermediation profits in the national market system.

---

62 Id. at 22.
64 Broker-dealers are licensed not only at the national level but also by regulators in the states where they operate. See Andrew Jennings, State Securities Enforcement, 47 B.Y.U. L. REV. —, __ (2021). The separation of rulemaking and enforcement authority owing to federalism can give rise to different standards of conduct at federal and state levels. Massachusetts’s enforcement action, discussed below, is predicated on the theory that broker-dealers owe state law fiduciary duties to clients even though federal law imposes no such duties. On federalism and state-law fiduciary rule developments, see, e.g., Benjamin P. Edwards, The Fate of State Investor Protection, 21 TRANSACTIONS: TENN. J. BUS. L. 213, __ (2020); Maria E. Vaz Ferreira, Note, Staying True to NSMIA: A Roadmap for Successful State Fiduciary Rules after Reg BI, 94 ST. JOHN’S L. REV. 557, 571–79 (2020).
1. “Re-retailization” in securities markets

One of the most important precipitating trends has been the re-emergence of retail investors in securities markets. Securities regulators and scholars might not have seen this looming trend on the horizon ten years ago, when retail interest in individual corporate stocks seemed moribund. At the time, securities law had identified a pair of trends—deretailization and institutionalization—that had shifted trading in single-name corporate stock from retail investors to institutional investors like public and private funds.66 During the post-war golden era of the American economy, retail investors made up the bulk of corporate shareholders.67 By some measures, they owned in the range of 70-75% of all corporate stock in the United States in 1979.68 That proportion reversed over the next several decades, with almost 70% of stock held by institutional investors by 2011.69 Retail traders had in significant numbers exited the market for individual equities, and shifted instead into diversified funds.70

But since these dire warnings, the deretailization trend has slowed if not reversed. Retail traders are participating more deeply and broadly than in recent years. Retail investors are also make up a larger share of trading volume. That share also rose from 2019 to 2020, and even more in 2021.71 Figure 2 reports data from Bloomberg Intelligence for individual investors’ share of U.S. equities trading


69 Jacobs, supra note 68, at 1650.


volume between 2011 and the first quarter of 2021.\textsuperscript{72} Retail investors’ trading volume is also disproportionately high relative to ownership share of total market value.\textsuperscript{73}

Retail investors are not just becoming more active, as a group they are growing in size and becoming more diverse. A research study sponsored by the FINRA Foundation found that people who opened an investment account for the first time in 2020 “were younger, had lower incomes, and were more racially diverse” than existing investors.\textsuperscript{74} Of course, given wealth and income inequality, participating in equity markets remains out of reach for many people.\textsuperscript{75} And the wealthiest households’ share of ownership has only continued to grow over time.\textsuperscript{76}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{individual_investors_share_of_us_equities_trading_volume.png}
\caption{Data from Bloomberg Intelligence on retail investor trading volume}
\end{figure}

\begin{itemize}
\item \textsuperscript{72} Caitlin McCabe, \textit{It Isn’t Just AMC. Retail Traders Increase Pull on the Stock Market}, Wall St. J. (June 18, 2021) (reporting Bloomberg Intelligence data). The data for 2021 is from first quarter, not annual.
\item \textsuperscript{73} See, e.g., Richard Stanley, \textit{Retail investors comprise 10 percent of U.S. daily trading}, \textsc{Precise Investors} (July 1, 2021), https://preciseinvestors.com/retail-investors-comprise-10-percent-of-u-s-daily-trading/.
\item \textsuperscript{74} Mark Lush et al., \textit{Investing 2020: New Accounts and the People Who Opened Them} (Feb. 2021).
\item \textsuperscript{76} See, e.g., \textit{Id.}; Thomas Piketty et al., \textit{Distributional National Accounts: Methods and Estimates for
\end{itemize}
Despite all that, record numbers of ordinary people have also been participating in the stock market.\textsuperscript{77} Greater liquidity in household finance—from changed budgets and exogenous wealth shocks from social welfare programs—has also plausibly encouraged a rise in investment.\textsuperscript{78} In this view, trading is a substitute for other kinds of entertainment.\textsuperscript{79} And as a practical matter, technology has enabled people to engage with speculative asset markets at low transaction costs on a nearly 24-7 basis on mobile devices. More people are engaging with markets exclusively digitally, heightening the stakes for regulators focused on behavioral design and DEPs.\textsuperscript{80}

But first, it is time to update the received wisdom from a decades-old scholarly debate about retail investors. Zero-commission trading has enabled partial re-retailization of capital markets. It has not, apparently, disrupted trends passive strategies. But the greater ease with which people can trade securities has enabled them to buy—or, in economists’ lingo, increased the elasticity of demand for buying—corporate equities directly, opening up stock investing to a more mass market audience.\textsuperscript{81} That greater ease is partly a function of technology, which has given traders around the world nearly direct access to markets. Less obvious, however, is the emergence of common availability of trading in fractional shares, or portions of stock less than one share.\textsuperscript{82} This reduces barriers to entry, allowing


\textsuperscript{79} The re-retailization trend in 2020 and 2021 lends credence to market commentator Matt Levine’s “boredom markets” hypothesis: with other entertainment shut down during the pandemic, markets for risky assets offered a substitute form of entertainment. See, e.g., Matt Levine, Money Stuff: If You’re Bored You Can Trade Stocks, BLOOMBERG OPINION (Apr. 30, 2020); Matt Levine, Money Stuff: The GameStop Game Never Stops, BLOOMBERG OPINION (Jan. 25, 2021), https://www.bloomberg.com/opinion/articles/2021-01-25/the-game-never-stops.

\textsuperscript{80} David Forman, Chief Legal Officer, Fidelity Investments, Comment Letter on Digital Engagement Practices (2021).


\textsuperscript{82} For instance, researchers at the FINRA Foundation and NORC at the University of Chicago surveyed various retail investor participants, including “New Investors” who opened a taxable investment account for the first time in 2020. The study found that New Investors were “younger, had lower incomes, and were more racially diverse” than those who opened a second taxable account and those who maintained existing accounts but did not open new ones. The study found that “the majority of all respondents ... reported making
investors to buy based on the amount of money they have rather the arbitrary number of shares they can afford.83

2. Competition and innovation

Price competition is a second factor in the emergence of behavioral design in stock trading apps. Retail investors bear certain costs for buying and selling stocks. One cost is the bid-ask spread, or the difference between prices at which a buy or sell order can be immediately filled; the spread is the compensation for market makers that stand ready to fill these orders.84

Another, more salient cost is the brokerage commission that brokers collect in compensation for effecting the client’s buy or sell order. These commissions used to be fixed, providing exchange-member brokers with monopoly profits.85 Commissions once made up a large part of the transaction costs of trading stocks, dragging investor returns and dampening trading volume.86 But reforms in the 1970s deregulated trading commissions; federal law adopted “competition” as a new foundational normative goal of the securities laws. This permanently changed Wall Street’s culture, encouraging cutthroat price competition.87

One consequence was the emergence of “discount” brokerage firms. Full-service brokers had offered services like financial planning, security selection, account monitoring, and research and information. By contrast, discount brokers offered cheap order-

a few trades per month.” And among New Investors, “the ability to invest with a small amount of money” was the most frequently reported reason (35 percent) for entering the stock market; 16 percent plurality cited it as their primary reason. Lush et al., supra note 74.

See SEC Office of Investor Education and Advocacy, Fractional Share Investing — Buying a Slice Instead of the Whole Share (Nov. 9, 2020); see also Asaf Raz, Share Law: Toward a New Understanding of Corporate Law, 40 U. Pa. J. Int’l L. 255, 315 (2018). To illustrate, someone with $20 who wants to buy an interest in stock trading at $80 can buy 0.25 shares. Though state corporate law authorizes and grants certain rights with respect to shares issued in fractional form, see, e.g., Model Business Corporations Act § 6.04, contractual rights govern treatment of fractional shares traded or acquired through a transaction in less than a whole share or through dividend reinvestment. Fractional shares might be beneficial insofar as they open up access to investment to a broader range of small-dollar investors. See, e.g., Fisch, supra note 5; see also, e.g., Gil Kaufman, Megan Thee Stallion Launches ‘Investing For Hotties’ Video Series, Giving Away $1 Million in Stock, BILLBOARD (Jun. 30, 2021) (describing a very popular rapper/songwriter’s video touting benefits of fractional-share investing).


87 See LOSS ET AL., supra note 85, at 289.
execution services without much more. This was attractive to self-directed investors who didn’t want more. Combined with technological innovation in the 1990s, price competition allowed investors to sort into the amount of hand-holding they wanted.

As price competition disrupted the industry, many retail-oriented broker-dealers offered zero-commission trading. The leaders were online brokers featuring apps with slick design. Robinhood first offered commission-free trading in 2013. Legacy discount brokers like Charles Schwab, Fidelity, and TD Ameritrade slowly reduced commissions in response; all cut commissions to zero in 2019. Now many retail clients of discount brokers trade without paying meaningful commissions for public company stocks.

Commission pricing is particularly important to retail investors. This reflects salience models of decisionmaking in the market for brokerage services. People are boundedly rational, and can’t consider all the attributes of some good or service. Even the well informed lack cognitive processing power to comparison shop across all attributes and consequences of one choice over another. So people consider and decide based on fewer than all the attributes of the service at issue, and focus instead on a handful of highly salient attributes—price, quality, and so on. As people don’t pay attention to nonsalient attributes, these do not bear on the decision to transact.


92 See Lyle Daly, Online Brokerage Statistics for 2020, The Ascent (June 19, 2020).

93 A similar dynamic has occurred in the mutual-fund market, as investors have become more sensitive to highly front-end-load fees and commissions, relative to less salient operating expenses. See Brad M. Barber et al., Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows, 78 J. BUS. 2095 (Nov. 2005).


95 See Tierney, supra note 28, at ___ (noting that to the extent there are no marginal customers selecting on these nonsalient attributes—which can include pricing dimensions and contract terms—they are not subject to competitive pressure).
Offering “free” salient pricing may require a cross subsidy from less- or nonsalient revenue sources. A customer might pay directly, as with in-app micropayments in games like Candy Crush. But it might also involve a third party paying for information: thus the modern adage that “[if] something is free, then you’re not the customer—you’re the product being sold.” Zero-commission brokers use a combination of these revenue sources. These include “selling clients financial advice, margin lending, net interest income, and payment for order flow (PFOF).” The last of these, PFOF, has had a peculiarly strong influence in zero-commission trading apps that use behavioral design. Let’s take a step back and consider why.

3. Market fragmentation and intermediation

The modern stock market is fragmented, which has created profitable opportunities for arbitrage and intermediation. Technological innovation, price competition, and deregulatory fragmentation of market structure have dramatically changed how ordinary individuals and sophisticated participants alike buy and sell stocks. The stock market today is a national market system of fragmented and competing trading venues: not a single place to trade stocks, but a dispersed and interlocking set of rules, institutions, and practices. As a result, there are many opportunities for sophisticated market participants to bridge gaps, providing liquidity while using information about retail order flow for profit.

When retail investors trade stocks, they can be executed several ways. The broker can execute the order internally, matching with other customer orders or securities on its balance sheet. It can route the order to a national securities exchange or alternative trading system. Or, as with most retail orders, it can sell the order with

---

96 See, e.g., Id. at 889; Levine, supra note 91 (noting that the “obvious” implication of zero-commission brokerage services is to “give people a good deal on the salient … thing, and … make your profits where they aren’t looking”).


98 Levintova, supra note 9.

99 Jerry W. Markham, Regulating Broker-Dealer Investment Recommendations—Laying the Groundwork for the Next Financial Crisis, 13 Drexel L. Rev. 377, 443 (2021); see also Shane Swanson, The Impact of Zero Commissions on Retail Trading and Execution (2020).

100 See, e.g., Merritt B. Fox et al., The New Stock Market: Sense and Nonsense, 65 Duke L.J. 191, 191 (2015) (observing that “the way stocks are traded in the United States … has been totally transformed over the last twenty years”).

101 See, e.g., WALTER MATTIL, DARKNESS BY DESIGN: THE HIDDEN POWER IN GLOBAL CAPITAL MARKETS (2019).

102 See id. The days are long gone when securities were sold in open-outcry trading floors. To
others to a third party that wants to trade against it. This competitive landscape is the product of the same 1970s deregulatory reforms that promoted the creation of a national market system. When open, the market runs a matching auction in effectively continuous time. Buy and sell orders are paired by electronic matching engines, and order books are constantly adjusted as sophisticated market participants—proprietary trading firms, market makers, and others—adjust to new information about the world and about the pattern of orders. What’s more, at any instantaneous time, there is a single best nationwide price—known in regulatory terms as the national best bid/offer—that should apply to certain trades that carry important price information.

All this illustrates a key attribute of the national market system: nationwide continuous time best pricing on geographically dispersed execution venues. This has enabled competition among dispersed venues. But it has also enabled arbitrage opportunities. Some of the arbitrage opportunities arising from market structure are the result of physical infrastructure limits. The national best bid or offer references prices on exchanges that may be physically far away. It takes time for signals to be sent across long distances, and price information on one trading venue may be “stale” when it has not been updated with information from other trading venues.

Some proprietary trading firms engage in latency arbitrage, leveraging superior investments in speed to capture tiny price differences across geographically dispersed venues before prices can

---

103 See infra note 112.
105 Eric Budish et al., The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response *, 130 THE QUARTERLY JOURNAL OF ECONOMICS 1547 (Nov. 2015).
107 Donald MacKenzie, Material Signals: A Historical Sociology of High-Frequency Trading, 123 AM. J. SOC. 1635, __ (May 2018) (“[T]he rules that constrain today’s U.S. share trading are formulated in terms of the best currently available price nationally, when in the Einsteinian materiality of speed-of-light signaling and microsecond response times that current best price depends on something not even mentioned in Reg NMS, an algorithm’s precise spatial location.”).
be updated.  

Nowhere is the effect of the national market system more apparent than in the arms race in developing physical infrastructure and trading algorithms that can earn very small profits, many times a day, to “correct” mispricings or promote price discovery across distance in continuous time. One recent working paper estimates that this has a modest tax on trading and increases social costs of liquidity.

But fragmentation has another consequence as well. This relates to adverse selection in the asynchronous arrival of orders in a continuous time market. Buyers and sellers of stock arrive naturally at securities markets at different times, creating a potential liquidity problem. One way broker-dealers solve this problem is by routing retail investor orders to principal trading firms—known in the business as wholesale dealers—that profit from taking the contra side. These firms provide liquidity to the markets, taking the opposite side of trade orders and (they hope) exiting them at a higher price. But they are concerned with the problem of “adverse selection”: an unknown trader on the other side might have better information about the future direction of the stock price, inhibiting a profitable exit from the trade. Retail investors generally aren’t better informed in this sense, so exposure to them reduces adverse selection risk. By paying retail brokers for retail order flow, these principal-trading firms make it more likely that their trades will remain profitable. And indeed, “nearly all market orders in listed securities are routed to wholesale dealers rather than an exchange.”

Zero-commission brokers have to find other sources of revenue. One source is a kind of kickback known as PFOF: third-party principal trading firms compensating the broker-dealer in exchange for routing retail order flow to them for execution. By virtue of being noisy, retail order flow creates profitable opportunities for these

---


112 Dombalagian, supra note 106, at 7.
firms to take the other side of the trade. PFOF gives brokers an incentive to send order flow to these “wholesaler” trading firms rather than internalize it themselves, and to maximize their own compensation for doing so. PFOF has been legal for years, though these payments must be disclosed and must be consistent with brokers’ duty to provide “best execution” to their clients. But the practice is also controversial. Some observers are concerned that brokers are putting their own interests ahead of their duty to the customer to provide best execution.

Fragmentation may well be good if it promotes liquidity and price discovery. But some of the animating motivations of stock market design supposed that “principal trading by broker-dealers did not serve the interests of ordinary investors.” The final of the three trends, then, tees up a potential conflict of interest in brokers’ adoption of behavioral design. It encourages a source of transaction-based revenue for the broker-dealer that is nonsalient to the investor. This encouragement, I suggest, is the most important basis for calls to regulate behavioral design.

II. DILEMMAS OF REGULATING BEHAVIORAL DESIGN IN RETAIL INVESTMENT MARKETS

Drawing on financial economics, this Part II examines theoretical and empirical models of retail investor decisionmaking. It then

113 TM Staff Mem., supra note 111.
115 See TM Staff Mem., supra note 111, at 8 (describing the Commission’s disclosure-based approach to regulating PFOF conflicts); see generally Allen Ferrell, A Proposal for Solving the Payment for Order Flow Problem, 74 S. CAL. L. REV. 1027 (2001). The duty of best execution requires brokers to exercise “reasonable diligence to ascertain the best market for the subject security and buy or sell in such market so that the resultant price to the customer is as favorable as possible under prevailing market conditions.” FINRA Rule 5310(a)(1); see also, e.g., Newton v. Merrill, Lynch, Pierce, Fenner & Smith, 135 F.3d 266, 270-72 (3d Cir. 1998).
situates those models within securities law theory.

A. Theoretical and empirical models of retail trader decisionmaking

Concerns about “gamification” reflect a longstanding puzzle about retail traders. Active traders underperform the market, often by a lot, yet excessive trading persists. Why? One suggestion is that behavioral design encourages potentially excessive trading. As this subpart discusses, recent empirical research bears out that information presentation can alter retail trader behavior in ways that may generate excessive or maladaptive trading. But trader behavior is not all alike, and the determinants of “excessive” trading differs cross-sectionally. Different traders contribute to the volume of noisy order flow for different reasons. Some trade for entertainment, sensation seeking, and aspiration to riches. Others trade because a security is highly salient to them, or because they have been duped into doing so.

Calls to regulate gamification often elide the distinctions between these models of investor behavior. Inattention to these distinctions would have real normative implications for securities regulation. Traditionally securities law has been concerned with the problems of salience and duping. But it has not generally prohibited speculating for entertainment. Practices in securities markets can still be objectionable absent fraud, such as where there are traditional market failures, or where some behavioral exploitation has changed the allocation of economic surplus between the buyer and seller. This subpart draws from literatures in financial economics modeling to illustrate why retail traders produce noisy order flow, and why broker-dealers and third parties might wish to encourage that order flow.

1. Risk preferences and consumption of nonpecuniary benefits.

One way of thinking about retail trading sees it as rational. Retail investors are capable of consuming and processing information, and making optimal choices about risk and return. This model of retail investor decisionmaking is reflected in the normative claim that

---

118 Cf., e.g., Lisa M. Fairfax, The Securities Law Implications of Financial Illiteracy, 104 VA. L. Rev. 1065, __ (2018) (noting a similar inattention of securities regulation to investors with different disclosure needs).


120 See, e.g., Lin, supra note 108, at 467.
securities law ought not be paternalistic; investors do not need to be saved from themselves.121

Perhaps if retail investors were rational, they would act consistent with traditional finance’s predictions to allocate assets optimally in a portfolio while minimizing transaction costs or losses associated with trading. In reality, of course, they do not do this. Across the population of retail investors, they trade frequently, for reasons unrelated to liquidity, tax, or rebalancing needs.122 And they do so to their detriment.123

One answer to the question of “excessive trading” is that it is not really excessive by the traders’ own lights. Even if they are losing, traders might be trying to satisfy other nonpecuniary preferences. Some prefer risk or for consumption of entertainment, in much the same way as gambling. Researchers have linked excessive trading with preferences for risky activities like speeding and gambling.124 Others prefer high volatility lotteries, as when trying to grow their wealth.125 For instance, clients of a German discount broker demonstrated nonpecuniary motives for trading, with a link between preferences for gambling and portfolio turnover, a measure of trading frequency. Researchers studying those traders identified three plausible reasons for entertainment trading: “recreation, sensation seeking, and an aspiration for riches.”126 Still others derive expressive or affinity benefits from coordinating with likeminded traders online.127 These nonpecuniary aspects of “playing” the stock


122 See, e.g., Mahoney, supra note 70; Brad M. Barber et al., The Cross-Section of Speculator Skill: Evidence from Day Trading, 18 J. Fin. Mkts. 1 (2014). Of course, some trades are related to portfolio balancing and “buy the dip” preferences, which has a broader effect of supplying liquidity to markets. See, e.g., Ivo Welch, The Wisdom of the Robinhood Crowd __ (Dec. 2020).


125 Younger people trying to grow their wealth may be particularly interested in pseudo-lottery assets, especially if mediated through attractive behavioral design. This bears on the importance of brokers’ attempts to target younger investors on regulatory responses.


market may also be what most make it like a “game” to some observers.\textsuperscript{128}

The flip side, of course, is that nonpecuniary benefits can come at pecuniary cost. If traders lose more than they make up for in other benefits, we should expect them to stop trading. Several empirical models of retail “trading to learn” suggest that losing traders are more likely to stop trading, but that losing traders nonetheless persist in the market as a group.\textsuperscript{129} The point is not a merely academic one, as Robinhood’s cofounder said in a podcast interview that its brokerage clients traded to learn—and suggested that performance improved with learning.\textsuperscript{130} The persistence of losing traders is puzzling, but securities law has little ambition to address it.

2. Attention-induced noise trading.

Another model of retail investor behavior focuses on imperfect rationality and informational asymmetry in shaping human behavior. Bounded rationality is a limit on all kinds of human decisionmaking.\textsuperscript{131} And securities law theory recognizes that bounded rationality leads retail traders to act noisily—in ways uncorrelated with the market.

Ordinary routinely believe, incorrectly, that knowledge of public information, material or not, about a company gives them an informational edge. It typically isn’t cost-effective for retail investors to engage in fundamental analysis or research to learn private information that can be traded on for profit. They routinely trade for reasons uncorrelated with payoff-relevant information.\textsuperscript{132} This is


\textsuperscript{129} Brad M Barber et al., Learning, Fast or Slow, 10 THE REVIEW OF ASSET PRICING STUDIES 61 (Feb. 2020); Brad M. Barber et al., Do Day Traders Rationally Learn About Their Ability? (Oct. 2017), https://faculty.haas.berkeley.edu/oedean/papers/Day%20Traders/Day%20Trading%20and%20Learning%20Research%2020110217.pdf.

\textsuperscript{130} Robinhood’s Vlad Tenev talks mission, THIS WEEK IN STARTUPS, episode 736 (2017).

\textsuperscript{131} See, e.g., Roger P. Alford & James Fallows Tierney, Moral Reasoning in International Law, in THE ROLE OF ETHICS IN INTERNATIONAL LAW 11, 34 (Donald Earl Childress ed., 2009).

\textsuperscript{132} See WAI MUN FONG, THE LOTTERY MINDSET: INVESTORS, GAMBLING AND THE STOCK MARKET 2 (Palgrave Macmillan UK 2014). Noise has an important role in financial markets. Some level of noise, in the sense of mistaken or heterogeneous beliefs about the quality of information relevant to the payoff from an economic asset, is necessary for liquidity to exist. Otherwise there will not be the kind of difference of opinion needed for buyers and sellers of securities to transact on beliefs about their private information, knowing that others likewise have analogous beliefs informing their own trade. See, e.g., Fischer Black, Noise, 41 THE JOURNAL OF FINANCE 528, __ (John Wiley & Sons, Ltd Jul. 1986); cf. JENS BECKERT, IMAGINED FUTURES:
information that goes to the economic payoff of the trade (say fundamental value of the underlying asset). When people don’t have superior private information, their transactions can be thought of as uninformed, uncorrelated, or noisy. Most trading by ordinary investors will be noisy with respect to payoff-relevant information. As this kind of noisy order flow from retail investors grows, it creates liquidity because people want to trade against them.

These models focus on the role of traders whose transactions reflect noise, not payoff-relevant information. Emerging in the 1980s and 1990s, “noise trader” models of retail trader behavior shaped much of the law and economics literature on securities regulation. This literature touched on issues such as how law should conceive of and respond to the presence of uninformed and noisy retail order flow in capital markets. Noise trader models continue to be influential in securities law theory, with noisy retail order flow being a key category in theories of stock market participants. Whatever the origin of these traders’ propensity to trade based on noise, “[o]vertrading phenomena are … likely to be exacerbated by individual investors’ operating through financial intermediaries, who have generally a specific economic incentive to encourage trading.”

One of the noisy reasons that people decide to buy or sell stocks (or crypto) is that they are susceptible to the presentation of information. The decision to buy, sell, or sell a risky asset is a partly

---


134 Black, supra note 132, at ___ (explaining that “it will become more profitable for people to trade on information, but only because the prices have more noise in them”).


136 See, e.g., Lin, supra note 108; Goshen & Parchomovsky, supra note 133.

137 See, e.g., the last subpart. To the point that traders can often have divergent reasons for trading (relative to the normative prescriptions of traditional finance), Lynn Stout offered a “heterogeneous expectations model of speculation posit[ing] that differences in traders’ beliefs—that is, subjective beliefs and bearishness—can be a catalyst for trading.” Lynn A. Stout, Irrational Expectations, 3 LEGAL THEORY 227, 228 (Cambridge University Press 2009/02/16 ed. 1997); see also Stout, supra note 119, at ___. Recent literature on sociology in financial markets may also be instructive in this regard. Jens Beckert argues that, to decide about future states of the world under incomplete information and cognitive power, people rely on “fictional expectations” that bring about future states of the world. BECKERT, supra note 132, at ___.

a decision about the expected outcome of different states of the world. It’s costly to calculate these expected outcomes and weigh them against other attributes, and ordinary people don’t make asset trading decisions on that basis. Rather, as in other markets, retail investors act like ordinary consumers. And like in those other markets, in making informationally complex decisions, people tend to choose based on a subset of highly salient attributes.\textsuperscript{139}

The concern for regulators and scholars is that “behavioral design” induces noise trading in particular assets that are salient among the choice set. Empirical research in financial economics has found evidence of this kind of attention-induced noise trading. Some of this evidence looks at the trading behavior of Robinhood investors, based on the firm’s onetime willingness to share information about investor holdings and trades through its computer API.

Eaton, Green, Roseman, and Wu model Robinhood traders as uninformed noise traders, and focus on “high attention stocks that Robinhood investors often favor.”\textsuperscript{140} Examining market quality measures at times the app had access outages, they find evidence that “quoted spreads, effective spreads, realized spreads, and price impact” are higher quality when Robinhood investors exit the market, suggesting that the presence of zero-commission traders has a negative effect on market quality. They also find that retail trader ownership of stocks is unrelated to future returns, and that the Wallstreetbets sub-Reddit “strongly predicts future zero-commission retail trading in ways that have implications for market quality.”

In addition, Barber, Huang, Odean, and Schwarz model attention-induced noise trading and momentum herding trades among Robinhood investors.\textsuperscript{141} They find that Robinhood clients

\textsuperscript{139} John Beshears et al., \textit{Behavioral Household Finance}, in \textit{HANDBOOK OF BEHAVIORAL ECONOMICS: APPLICATIONS AND FOUNDATIONS} 1, 177, preprint § VIII, at 46–47 (B. Douglas Bernheim et al. eds., 2018) (collecting literature on “situations in which households have been shown to overweight salient attributes and underweight shrouded attributes”). Other models in financial economics have underscored the role that salience of product attributes plays in shaping customer choice. When people are subject to cognitive processing constraints, they cannot comparison shop on the basis of more than a handful of attributes, so they select on those that are particularly salient to them. The implication is a business model that we see across markets and industries: “firms exploit these propensities by designing products and contracts that make appealing attributes salient while shrouding fees and quality problems.” \textit{Id.} at 47.


\textsuperscript{141} Brad M. Barber et al., \textit{Attention-Induced Trading and Returns: Evidence from Robinhood Users} (Feb. 2021).
tend to trade disproportionately in attention-induced and highly salient stocks. They find that the top mover list increases the salience of these stocks, inducing demand for trading of them. They also find that herding trades have negative returns for Robinhood investors.

Stein examines entry of stocks into Robinhood’s now-deprecated leaderboard of most concentrated stocks in user portfolios. He documents the role of salience in influencing investor behavior, finding that entry into the leaderboard is predictive of a spike in trading volume among users and that a short-term buy and sell strategy may be a profitable trade.

Finally, a working paper from Havakhor, Rahman, Zhang, and Zhu examines the role of technologically mediated access to raw financial data on inducing retail trader demand for stocks. Exploiting the effect of the shutdown of the free Yahoo Finance API on returns to retail-trader-favored stocks, they find a short term decrease in trade volume and, for the remaining trades, an increase in “predictiveness of future returns.” They posit that access to this data fosters “a false sense of knowledge and control,” with “overconfidence … lead[ing] to more excessive trading” and “aggravat[ing]” … behavioral biases.

3. Dark patterns, habit forming technology, and choice distortion.

There is a third kind of model of retail investor behavior. It depends less on financial economics’ understanding of investor behavior and more on ordinary people’s general susceptibility to the way that information is presented in ways that change their behavior in ways that depart from their preferences. This third kind of model likewise draws on economic frameworks. It is the bread and butter of research on “dark patterns,” “habit forming technology,” and other ways that user interface and user experience design features can affect decisions and choices made. The lesson is that designers can intervene in decisionmaking processes to encourage outcomes that the person otherwise would not have chosen.

In securities markets it can be hard to discern what people would have chosen “otherwise.” Empirical strategies that rely on observed trading behavior are particularly hard because trading preferences

142 Rob Stein, The Top 5 predictable effects of new entries in Robinhood’s “100 Most Popular” List (Sept. 2020).


are endogenous. And as Michael Guttentag has pointed out, a full assessment of the allocation of economic surplus can’t be limited to behavioral exploitation in simple cases where people are duped into transactions they wouldn’t have entered into; it also bears on cases where behavioral exploitation leads them to enter into a transaction that disfavorably reallocates economic surplus to the counterparty, even where they have not exceeded their reservation price.145

As a result, regulators might look to broader literatures on the effect of particular user interface design practices on consumer behavior. One study of Robinhood, in particular, was bearish that it was designed to promote good consumer behavior.146 In undertaking regulatory responses on the basis of a third model—about the role of behavioral design generally, and not attention induced noise trading specifically—regulators should remain attuned to the limits of what the more general academic research can tell us about how apps encourage trading.147

B. Situating behavioral design within securities law theory

These models of investor behavior reflect that some people have preferences for speculative trading, while others are essentially duped into trading. The latter has traditionally been the concern of securities law. This subpart introduces several of the underlying theoretical and normative policies of the securities laws, and assesses how these bear on regulatory interventions toward gamification.

1. Agency costs in brokerage and investor protection.

Retail traders must access markets through brokers, who act as agents. As in other principal-agent relationships, brokers’ pursuit of their own rational self-interest may conflict with the client’s interests.148 Agents have different incentives than principals. So where it’s costly to monitor or build trust in the relationship, agents can act in ways that aren’t in the principal’s interests. One such misaligned incentive arises from brokerage compensation. The receipt of transaction-based compensation is a hallmark of brokerage.149 This kind of compensation gives rise to an incentive to

---

145 Guttentag, supra note 27.
146 See Chaudhry & Kulkarni, supra note 35, at __.
149 See, e.g., Allan Michael Roth, Exchange Act Release No. 90343, 2020 WL 6488283, at *3 (SEC
encourage more trading—perhaps even more than they want.  

This kind of agency cost problem is intimately familiar to scholars of capital markets.  

And so too to regulators: the SEC’s guidance, for instance, on economic analysis in rulemakings identifies “principal-agent problems (such as economic conflicts of interest), and asymmetric information” as justifications for regulatory action.  

In fact, concerns about the conflict of interest in brokerage have been a mainstay of broker-dealer regulation for nearly a century.  

This model is premised on provision of advice consistent with professional duties of care. As a result, securities law has traditionally distinguished between self-directed investors and those advised by brokers. Even more recent disputes over sales-practices rules like Regulation BI reflect tradeoffs between competing visions of what securities regulation should do about this agency cost. The SEC under the Trump administration’s chair, Jay Clayton, adopted in Reg BI a model that largely preserved the most significant source of agency costs for retail brokers, limiting most of the duties in cases of self-directed trades not involving a “recommendation.”

But the basic problem of shaping consumer behavior for private profit is not new, even in the world of retail investment markets. One concern of broker-dealer regulation was the boiler room, memorialized in the Leonardo di Caprio film THE WOLF OF WALL STREET (2014): a call center in which high-pressure salesmen compete

---

**Notes:**


154 See infra notes 274-276.

155 See Hurwitz, supra note 34, at 63 (noting that ”there is nothing terribly new about merchants shaping the customer experience to their own advantage”).
for high commissions by pitching speculative securities to strangers.\textsuperscript{156} The boiler room has been a longtime target of securities regulators and has largely gone away in its silver-screen form. But the boiler room operated on a similar premise of appealing to people’s psychology in ways that encourage them to trade when they otherwise wouldn’t.\textsuperscript{157}

What increasingly worries regulators is that technology has allowed the boiler room to take a new form. Digital engagement practices appeal to retail investors’ cognitive psychology. In a world in which trading commissions have been bid down to zero, broker-dealers compete for clients on other attractive product and service attributes: flashy app design, push notifications, leaderboards, lotteries for stock awards, and highly salient attention-grabbing lists of attractive stocks.

But the use of “game design” should not itself be of concern to securities law, or an object of regulatory intervention.\textsuperscript{158} Some of these design features are the natural evolution of sales techniques that have long existed in physical space.\textsuperscript{159} Behavioral design should not be primarily objectionable because it is digital, flashy, or appeals to children. It is objectionable because it encourages maladaptively excessive patterns of trades and trading in unsuitable securities.

To build out this intuition, imagine the following hypothetical.\textsuperscript{160} A brick and mortar brokerage office is slickly designed with lots of glass, video monitors, free coffee, and other attributes that make the waiting area an attractive place to wait while another customer is helped. A client walks into the brokerage office to open an account and place a securities trade. Upon confirmation that the trade has been executed, the broker’s representative hands a trade confirmation to the client without saying a word, then flings confetti in the air and sets off an air horn. What about this should securities law consider objectionable?\textsuperscript{161}

\textsuperscript{156} \textsc{The Wolf of Wall Street} (2014). Perhaps an even better example is the older, eponymous film featuring Giovanni Ribisi and Vin Diesel, but I was advised that readers aren’t likely to have seen it. \textit{See Boiler Room} (2000).

\textsuperscript{157} Cf. Gullotti, \textit{supra} note 47 (suggesting that DEPs make apps like boiler rooms).

\textsuperscript{158} See Langvardt & Tierney, \textit{supra} note 15, at __ (arguing that securities law should avoid intervening at the level of game design).

\textsuperscript{159} Cf. SIFMA, \textit{Comment Letter on Digital Engagement Practices} 4 (2021) (noting that DEPs reflect “the same potential conflicts” as in any client communication).

\textsuperscript{160} Thanks to Alex Platt for the basic contours of the hypothetical.

\textsuperscript{161} The primary objection to gamification can’t be that it appeals to children, an issue that raises a number of special issues. Consider the difference in the hypothetical between two clients, one twenty-six years old and the other sixteen. Children typically lack capacity to enter into brokerage contracts. \textit{See Request for Information and Comments on Broker-Dealer and
What seems most relevant here is the consequence on the client’s propensity to trade. If the confetti encourages the client to place another trade that would not have otherwise been made, the confetti would no longer have merely expressive effect. It is the means through which the broker alters the client’s propensity to trade in a way that increases revenue to the broker: a call to action, if you will. John Coffee has pointed out that what matters is the refinement of the interaction over time to encourage trading.

If this is a bit abstract with one client, let’s zoom out and consider the case of a thousand client interactions with brokers that play out this way. While individual clients show variability in responses, as a population the clients tend on average to trade more than they would have, all else equal, had they not experienced the confetti and air horn. These behavioral design attributes creating a predictable upward deviation in clients’ baseline propensity to trade, without regard to the actual security traded and without regard to direction (buy or sell). To this end, several commenters on the SEC’s request for information highlighted that we might think of DEPs in terms of practices reasonably expected to cause a retail customer to take

---

Investment Adviser Digital Engagement Practices, Exchange Act Release 92766, 86 Fed. Reg. 49067 n.22 (Sep. 1, 2021) (noting that legal capacity in this sense “is a matter of state law, and not explicitly governed by the securities laws”). Perhaps, too, there is a social judgment that children are not competent to bear equity risk, at least without being underwritten or cosigned by adults. Or perhaps our objection is to the broker’s failure to maintain supervisory practices and procedures reasonably designed to assure compliance with know-your-customer duties in connection with high school sophomores showing up with fake IDs to start trading exotic securities. See, e.g., FINRA Rule 4512 (Customer Account Information); Exchange Act Rule 17a-3(a)(17), 17 C.F.R. § 240.17a-3(a)(17) (requiring brokers to keep accurate books and records about customers). These particular objections largely disappear for the older trader. The older trader’s circumstances may still bear on ability to bear equity risk, especially for a novice trader who is underinformed and undersophisticated. And it may make the particular product unsuitable for the customer. But the capacity and know-your-customer issues would be eliminated.

All we are left with is a broker flinging confetti across the office at an adult who probably should feel sheepish about the whole thing. We might still consider that practice crass, or out of the norm for the typically staid brokerage industry’s norms governing communications. Yet this would not be the sort of expression that would fall within FINRA’s rules providing for review and content standards for communications with retail investors, which apply only to written and electronic communications distributed to more than 25 retail clients. See FINRA Rules 2210(a)-(d). This reflects, apparently, the contestable policy judgment that non-written, non-electronic expression pose relatively little investor-protection risk.

---

162 See infra Part III.C.2 (explaining that a primary doctrinal hook for engaging behavioral design is through Regulation Best Interest and its concept of a “recommendation,” defined in part as a “call to action”).

action.\textsuperscript{164}

In this thought experiment, the confetti and air horn are meant to be a bit tongue in cheek. They are an illustrative stand-in for various attributes of behavioral design that regulators are solving for. Deviation from the baseline is an empirical question about how these design attributes function. Scholars and regulators are collecting data, and more research is needed. Academic and regulatory financial economists face hard questions of causation, but from a regulatory perspective the evidentiary problems are not insurmountable. The SEC is less tied to economic analysis when it relies on its statutory authority as a market fairness regulator.\textsuperscript{165} Indeed, securities law is in safe territory in responding to the brokerage conflict of interest on fairness grounds.

2. Excessive noise trading and the gambling analogy

For as long as there’ve been noise trader models of retail investor behavior, securities regulation scholars have suggested that law should respond by tamping down on noise trading. Donald Langevoort suggested a decade ago that if securities law were to direct attention to behavioral economics and the problem of unsuitable investment, this “scrutiny, in turn, might allow a coherent policy on retail investor protection to emerge.”\textsuperscript{166} And Alicia J. Davis has argued that “if individuals, as a group, act as noise traders, society might be better served if the direct participation of retail investors in securities markets did not exist.”\textsuperscript{167}

This reflects a broader debate about the weight, if any, that we should put on burdens on transactional freedom in assessing policy choices. Many politicians, scholars, policymakers, and even in the public are opposed to “paternalism.”\textsuperscript{168} But it is entirely appropriate to restrict transactional freedom where there is evidence of market failures in which participants are subject to cognitive or behavioral errors. As Jeffrey Rachlinski has described the field, “the cognitive error story suggests placing significant restrictions on access to the

\textsuperscript{164} See, e.g., Blaine F. Aikin & Frank C. Mindicino, Comment Letter on Digital Engagement Practices (2021) (arguing that “DEPs that lead to statistically significant changes are recommendations or advice”).

\textsuperscript{165} See J.W. Verret, Robinhood’s Threat to Sue the SEC Over Broker-Inducement Regulation Unlikely to Succeed 9 (Nov. 2021).

\textsuperscript{166} Langevoort, supra note 66, at 1081.

\textsuperscript{167} Alicia J. Davis, Market Efficiency and the Problem of Retail Flight, 20 STAN. J.L. BUS. & FIN. 36, 44 (2014).

\textsuperscript{168} See, e.g., the Libertarian Party.
markets.” Behavioral interventions may be particularly warranted where there is a risk that these cognitive errors lead to people getting bilked.170 If people are overtrading to their detriment, when they otherwise would not, the paternalistic view would deem it “better for a wise and sympathetic central authority to limit that freedom.”

The main case for curbing noise trading is that it is behaviorally maladaptive. Even if some traders do so for rational reasons, others are unintentional speculators. They want to make money but trade excessively for imperfectly rational reasons to their disadvantage. They are overconfident in their statistically implausible effort to beat the market. They trade for uninformed reasons and are attracted to things that are salient. They exhibit herding behavior in stocks that are salient for whatever reason—a broker’s recommendation, a social media tout, a coordinated manipulation (like a pump and dump), or other exogenous publicity (like a movie character dying after using the company’s product).172

If speculation is unintentional and maladaptive, as behavioral design’s critics suggest, one solution is to supplant individual choice and prohibit a kind of casino-like speculation in stock markets by retail investors entirely. After all, mightn’t it be better if we just said

---


171 Mahoney, supra note 70, at __. Rachlinski argues that “[t]he psychological case for paternalism, … must rest on a relative assessment of the cognitive costs of improved decision against the costs of supplanting individual choice.” Rachlinski, supra note 169, at __. For a skeptical take, see Mercer Bullard, Fiduciary Standard: It’s Not What It Is, but How It’s Made, Measured, and Decided, 87 ST. JOHN’S L. REV. 337, __ (2013) (observing in the context of broker-dealer regulation that concerns about paternalism appear to be asymmetric, as proponents “embrace utilitarian analysis when more paternalistic policies are being considered, … [and] eschew[ ] utilitarian analysis when the public policies considered would increase individual freedom rather than constrain it”).

172 See, e.g., Aimee Picchi, Peloton stock slumps after morbid product placement in “Sex in the City,” CBS NEWS (Dec. 10, 2021). Traditional finance thinks of this stuff as not particularly relevant to asset pricing, at least in the sense of trying to derive the fundamental value of an asset by discounting future cash flows in expectation. But certain of this stuff, like an emergent practice of coordinated manipulation trades mediated through Reddit and other social media, may no longer meet our notions of order flow that is uninformed. Dealers don’t have much inventory risk trading against uninformed and uncorrelated retail order flow, but if the nature of the flow changes it changes dealers’ risk profile. Likewise, suppose you were a portfolio manager at a private investment fund newly exposed to this kind of order flow. Wouldn’t it breach a duty of ordinary care not to think of these things as relevant to your asset pricing? Brian L. Frye suggested that we should consider these as “new” fundamentals, though it also illustrates the difficulty with talking about fundamentals at all. Cf., e.g., THOMAS PISTORIUS, HETERODOX INVESTMENT THEORY (2017).
retail investors had to invest in target date index funds? This kind of proposal reflects a longstanding concern in American thinking about financial markets about the function and desirability of “speculation.” Securities markets are not lotteries, of course, and there are disparate regulatory regimes covering gambling and gaming in jurisdictions where they are legal. But suppose we were to say that people could not trade stocks, only institutions could. It might be objected that law would, in this manner, put a thumb on the scale in favor of a particular view of securities trading—i.e., that people should quit speculating on individual stocks and trading actively. Yet we already restrict participation in financial activity in all sorts of ways—such as in the Rule 144A market for resale of private placements between qualified institutional buyers, or as Emily Winston has described in the context of short sales.

In related contexts, law expresses a preference for certain retail investment behavior as a default rule. The Uniform Prudent Investor Act, which is part of the Restatement (Third) of Trusts, supposes a reasonable investor who allocates capital in the shadow of traditional finance’s normative prescriptions. This encourages and constrains investment options for the benefit of ordinary people, channeling them toward what reasonable and prudent investors would do: buying and holding a portfolio allocated to assets that are suitable and that produce an optimal risk-return tradeoff (unless some other allocation would be in the person’s best interest). The default rules thus instruct that prudent people shouldn’t be day trading, even less so in Dogecoin.

---


175 Langevoort offered this thought experiment in considering what such a market would look like if protected by an antifraud-only rule. He suggested that it would look something like today’s Rule 144A market, which is limited to institutional participants. Langevoort, supra note 66, at 1047.

176 See Id.; Winston, supra note 17, at __.


178 See id. § 2.

179 See Marilyn Odendahl, Estate planning attorneys say clients must keep their crypto-keys in a secure place, THE INDIANA LAWYER (May 26, 2021).
What’s more, securities law frequently intervenes in the transactional freedom of retail investors. It just tailors those interventions by looking at existing wealth as a proxy for sophistication or ability to bear risk, justifying these interventions for their consequences rather than for their burden on transactional freedom.\textsuperscript{180} The accredited investor standard has historically limited investment in private securities to institutions and wealthy individuals.\textsuperscript{181} The pattern day trader rules have a similar effect of gatekeeping access to the already wealthy by requiring customers to post $25,000 minimum collateral in a margin account to engage in round trip day trading.\textsuperscript{182} Margin rules also gatekeep who can take downside bets by selling shares short. In these ways, securities law has important effects on the cross-sectional allocation of economic surplus. As Emily Winston has recently suggested, securities law should explicitly consider the effect on access to investment opportunity in worsening wealth inequality.\textsuperscript{183}

Securities law can do only so much, of course. These interventions limit who can speculate in securities markets, and they may have expressive effects. But we ought to be humble about the ability of law or regulation to tamp down on peoples’ excitement for speculative asset markets not based on superior private information. Some noise trading will be inevitable so long as people trade based on irrational exuberance (and so long as securities law does not “save” them from doing so).\textsuperscript{184} As “[n]oise trading cannot be prohibited as such,” the question is how much to tolerate, and by whom.\textsuperscript{185}

This field of law is structured in many ways that reduce opportunities for short-term speculation on price momentum in asset markets.\textsuperscript{186} Regulating behavioral design in investing apps raises hard questions about the role of retail investors in securities markets—and whether securities law should promote not just prudent investing but also speculative gambling. Many of the

\textsuperscript{180} As a result, securities law is not concerned with paternalism as such. See, e.g., Bullard, \textit{supra} note 171, at 351; Welle, \textit{supra} note 170, at __.

\textsuperscript{181} \textit{See infra} note 245.

\textsuperscript{182} \textit{See infra} notes 227-229.

\textsuperscript{183} \textit{See} Winston, \textit{supra} note 17.

\textsuperscript{184} \textit{See} ROBERT J. SCHILLER, \textit{IRRATIONAL EXUBERANCE} (2005). As markets for crypto illustrate, when retail demand can’t fill its risk preferences in regulated securities and derivatives markets, it exerts hydraulic pressure elsewhere in the system as people try to substitute into other speculative assets.

\textsuperscript{185} Pacces, \textit{supra} note 138, at __.

\textsuperscript{186} \textit{See} Stout, \textit{supra} note 119, at 703.
objections to behaviorally distorted active trading apply just as robustly to active trading generally. Once we suppose that deploying behavioral design to elicit informationally noisy trading is a kind of behavioral exploitation (even without scienter!), “[w]e are right back to the task of defining opportunism in the laws regulating the securities industry, which the SEC cannot comfortably ignore.”

That question becomes even more urgent when we consider why we care about retail investor regulation. One reason is that investor protection promotes the confidence necessary to ensure the system does not unravel. But there is an often overlooked but equally important second reason. In a capitalist society without robust social provisioning, prudent investing is essential to ensure successful and comfortable smoothing of income across time to achieve financial goals. Leaving that big responsibility up to individuals is a daunting enough prospect when they are predictably bad at it, let alone when the financial advisors to whom they entrust their money depredate against them.

III. WHETHER AND HOW TO REGULATE BEHAVIORAL DESIGN?

This Part sets up a framework for thinking about the harms from behavioral design, then offers a typology of regulatory techniques.

A. The social costs of behavioral design in retail investment markets

There are many reasons to suspect that behavioral design in this context runs against the public interest— and in turn, many possible justifications for regulation. Turning investing into a more casino-like environment threatens prospective losses to investors, plausibly reallocates surplus from traders to financial intermediaries, and threatens to disrupt the traditional capital allocation functions of secondary capital markets. Behavioral design encourages ordinary people’s worst impulses in stock markets, burdening their ability to achieve long-term financial goals, and imposing second-order harms on the quality of and confidence in the securities markets.

1. Loss and waste.

Perhaps the biggest concern about behavioral design is that it leads to suboptimal or maladaptive financial outcomes for traders. Lynn Stout predicted in 1997 that zero commission retail trading

---

187 Langevoort, supra note 66, at 1047.
would be socially wasteful. It encourages demand for speculative brokerage trading and may divert attention and resources from the real economy. Stout predicted that (if it ever were to happen) retail traders would “daily waste hours at their computers ... in their statistically hopeless quest to beat the market.”

Today, regulatory concern that gamification makes it too easy to trade reflect what Stout predicted but characterized as an “exaggerated” image in 1997 when she considered social welfare effects of these trades.

Remember that some traders do so excessively for rational reasons, like aspiration for riches, sensation seeking, and recreation. The main payoff for this kind of trade is not engaging with the design; in Bloomberg columnist Matt Levine’s telling, “seeing if you made money” is “the main dopamine payoff.” But that payoff can be manipulated through the presence of other behavioral design features, even where customers can see that they have not made money. Some subset of traders will experience idiosyncratic or catastrophic loss of principal. And where people trade too much, engaging on average in a series of transactions that have negative net present value, encouraging that kind of losing transaction is socially wasteful.

Behavioral design can also lead us to make unreflective decisions that are bad for us, in the sense that they are against our otherwise undistorted preferences. Many retail investors lack financial literacy and are uninformed participants in capital markets. But behavioral biases are another drag on investment return. As in other markets for complex financial products and services, retail investors—ordinary consumers—are overconfident in their abilities, myopic about the consequences of their action, and avoid the cognitively complex tasks required to assess financial choices.

Inexperienced and unsophisticated investors can experience

---

188 Stout, supra note 81, at 810.
189 Id. Although she considered this prediction “exaggerated,” she suggested that “observer[s] sensitive to speculation’s peculiar welfare effects” might not be “reassur[ed]” by the prospect of 24-7 access to markets on your “PC, pager, or other wireless device.” I would have liked to have read her take on gamification.
191 Mahoney, supra note 70, at 728 (“These expenditures also prompt excessive investment of human and physical capital in the securities industry.”).
192 See Fairfax, supra note 118, at ___.
193 See Oren Bar-Gill, SEDUCTION BY CONTRACT: LAW, ECONOMICS, AND PSYCHOLOGY IN CONSUMER MARKETS 17-23 (2012); see also Tierney, supra note 26, at 882.
significant harm from the kind of compulsive trading enabled by zero-commission brokerage and behavioral-design strategies.⁹⁴ Years of academic research show that self-directed retail investors who try to pick stocks typically are unable to beat the average return on a market portfolio—especially when they try to chase price momentum in high-volatility stocks.⁹⁵ Retail investors who actively trade underperform inactive traders as well as benchmarks net of transaction costs. For instance, Barber and Odean reported a significant performance penalty for actively trading households; in their sample it was “the cost of trading and the frequency of trading, not portfolio selection, that explain the poor investment performance of [these] households.”⁹⁶

Gamification’s goal of encouraging engagement with the app creates conditions for poor financial decision making. For some subset of individual traders, moreover, behavioral prompts can lead users to engage in actively self-destructive and problematic-use behavior. Even a relatively casual zero-commission trading habit has the potential to do meaningful damage at an individual level.

2. Distribution in the brokerage agency relationship.

Separate from the possibility that behavioral design will lead to maladaptive trading, some have contended that it effects a redistribution of trading profits from retail investor clients to an intermediary. To understand the nature of the objection, consider the kind of conflict of interest in a client-broker relationship. These relationships can be thought of as principal-agent relationships, as Deborah DeMott has recently modeled.⁹⁷ To the extent the broker profits more the greater the trading volume, brokers will always have an incentive to encourage trading. The fundamental tension behind the history of brokerage regulation is about trying to

Note:

⁹⁴ There is evidence that the volatility in “meme stocks” like GameStop, combined with active trading and poor market timing, resulted in many retail investors experiencing significant losses. See, e.g., Rachel Louise Ensign, GameStop Investors Who Bet Big — and Lost Big, Wall St. J. (Feb. 15, 2021), https://www.wsj.com/articles/gamestop-investors-who-bet-big-and-lost-big-11613385002. Undoubtedly many were winners too, and others haven’t yet realized gains or losses. There is also a question of whether Robinhood investors are good or bad traders at the aggregate level. For discussion of the evidence, see Part II.A.2. If you focus at aggregate level, it “might mask substantial investor heterogeneity, making it difficult to understand potential redistributive effects of this technology.” Ankit Kalda et al., A within Investor-Time Analysis of New Technologies and Trading Behavior 6 (Apr. 2021).


⁹⁶ Barber & Odean, supra note 6, at 776.

⁹⁷ DeMott, supra note 148.
constrain and channel the means by which brokers can earn profits at the “expense” of their clients.

These criticisms are part of an ongoing historical process of regulatory contestation about how to divide the profits from capital markets trading between retail investors and sophisticated financial intermediaries. The academic literature on securities law has grappled with that problem for some time, trading off notions that these profits should be ordered by the market or should be constrained through fiduciary duty. One of the key tensions since deregulation has been about how to split up the pie between brokers and their clients. And as a distributive matter, by distorting and obstructing the processes by which retail investors make informed and pro-adaptive choices about asset allocation and security selection, behavioral design encourages risky trading behavior primarily to permit third-party intermediaries to skim trading profits. This is not only a tax on the entire system, it is plausibly a zero-sum redistribution to financial intermediary firms from retail investors who simply don’t know better.\(^{198}\)

Securities law in this context seeks to trade off several goals: producing efficient markets, encouraging capital formation, and protecting investors. Securities regulation protects investors not only through disclosures of broker-dealer and investment advisor practices, but also through substantive regulation of their sales practices. The political economy of broker-dealer regulation, moreover, tends to put a thumb on the scale in favor of retail investors. To that end, FINRA and the SEC are publicly concerned with “Mr. and Mrs. 401(k)” or the “main street” investor, even as rules are designed largely with the interests of Wall Street in mind.\(^{199}\)


\(^{199}\) See, e.g., Alexander I. Platt, The Non-Revolving Door, J. Corp. L. (forthcoming 2021) (describing revolving-door concerns about whose interests matter to the SEC); Michael Iselin, Bret Johnson, Jacob Ott, and Jacob Raleigh, Protecting Wall Street or Main Street: SEC Monitoring and Enforcement of Retail-Owned Firms (Dec. 2020); David J. Lynch, SEC boss
The SEC has said that commission-free trading comes “with a catch” of potential breach of best execution. But we should be careful about explaining the nature of the distributional criticism in favor of retail investors. Breach of best-execution duty “is often imperceptible to the retail investor.” Even a simple illustration helps show why it is unclear whether PFOF effects a redistribution in a way that leaves investors noticing that they are worse off. In 2018, before the emergence of zero-commission pricing, it would have cost an ordinary retail investor about $5 to trade a stock or ETF. This would make it economically infeasible to put a small amount of money into the stock market at any time. Suppose that I had $100 with which to buy stocks—5 shares of a stock worth $20 each. After transaction costs I would have been left with about $95 in value, or a 5% tax on each share. Even at higher transaction amounts—say a “round lot” of 100 shares at $20 each—the commission would have eaten away 5 cents per share, or 0.25% on each share.

In an era of zero commission pricing, I get the full value without paying the tax-like commission. The flipside is that I might get slightly inferior execution compared to what I am legally entitled. But for a trade like this, the zero commission pricing will leave many retail investors better off than any inferior execution they might receive from their broker. Inferior execution in this sense shows up on the price at which the retail order executes. A liquid stock trading for $20 at the midpoint might actually, as a matter of market structure, be bid of $19.99 and ask of $20.01. Dealers capture the two cent spread as compensation for taking the other side of these trades. Inferior execution might mean slight variance of the effective price relative to the best bid or ask. Retail traders in this situation have more to fear from a wide spread in an illiquid security, which if wide enough (a bid might approximate the 5% effective commission on that order. But for slippage in execution to start to matter, the spread has to be much wider. This suggests that the distributional objection is weak when considered in light of consumer welfare benefits from zero commission trading.

3. External harms to markets and capital allocation.

Attributes that encourage habitual consumption of a good or

---

Clayton touts his populist shift, FIN. TIMES (July 26, 2017).

200 See, e.g., In re Robinhood (Dec. 17, 2020).

201 Dombalagian, supra note 106, at __ (explaining that any harm from breach of the duty of best execution “is often imperceptible to the retail investor”).

202 By a similar token, why pay gas fees for Ethereum?
service tend to distort individual decisionmaking in ways that can produce systemic external harms. As the capital markets play an important coordinating role in our economy, making the potential harms from distorted individual decisionmaking all the more acute. These harms include the price discovery and capital allocation functions of capital markets.\footnote{Behavioral design and shift to a zero-commission model might also reduce incentives for the production of brokerage research. Thanks to George Georgiev for this point.}

Take price discovery. Noise trading is uncorrelated with new information going to fundamental value of the security. But the presence of noise traders in a market may nonetheless promote price discovery, as they attract more informed traders to “bring prices in line with fundamental values.”\footnote{Evans, supra note 66, at 1119–20} Yet several recent studies have suggested that the particular combination of zero-commission trading with behavioral design distorts the price discovery process by increasing both price movement and volatility in stocks popular among retail investors.\footnote{See, e.g., Eaton et al., supra note 140. (characteristics of Robinhood users and effects on stock market quality); Samuel Adams & Connor Kasten, Retail Order Execution Quality under Zero Commissions (Jan. 2021). (finding “that the elimination of commissions for retail investors improved execution quality for orders directed to third-party market makers”); Pankaj Jain et al., Trading Volume Shares and Market Quality in a Zero Commission World (2021).} One study, for instance, looked at market quality on days when Robinhood experienced service outages. The study authors report that on these days, the stocks otherwise most popular on Robinhood showed less price volatility and less trading volume.\footnote{See Gregory W. Eaton, T. Clifton Green, Brian S. Roseman, and Yanbin Wu, Zero-Commission Individual Investors, High Frequency Traders, and Stock Market Quality, preprint (April 2021). The authors also reported descriptive evidence, “consistent with lack of expertise,” that the most commonly visited topic on Robinhood’s FAQ page was “what is the stock market.” Id. at 13.} “Taken together,” the authors wrote, “the findings support the view that zero-commission traders have negative effects on stock market quality, consistent with behavioral noise trader and inventory risk models.”\footnote{Id. at 5-6.}

The piling-on trades that aggressive gamification promotes can also distort allocation in capital markets.\footnote{See, e.g., Benjamin P. Edwards, Conflicts and Capital Allocation, 78 OHIO ST. L. J. 181, 186 (2017) (explaining that conflicts of interest between brokers and clients have the potential to “drive[] capital misallocation, causing significant macroeconomic and other harms”).} The combination of the online “retail army,” combined with the ease and encouragement of in-and-out trading through zero-commission brokerage, has the potential to alter the capital markets’ traditional capital-allocation
Before turning to doctrinal interventions, it bears briefly addressing a possible objection at this point. Securities law scholars and regulators might contest as a normative matter whether the SEC should be in the business of being a fairness regulator, concerned with protecting investors for reasons other than promoting efficiency, competition, and capital formation. But that train has sailed; as J.W. Verret has noted, some may prefer “as a policy matter” that the SEC should intervene lightly in the brokerage market, avoiding its role in regulating fairness—but that “would require major statutory reform of the Securities Exchange Act.”

Not only has Congress authorized the SEC to undertake rulemaking to address the standard of care for broker-dealers, it has also given the SEC substantial leeway in fulfilling its investor-protection function as a fairness regulator. The SEC should embrace this role as a fairness regulator with respect to behavioral design and digital engagement practices. The agency is on strong footing in responding to supposed market failures and in protecting investors. Its fairness mission permits it to consider the cross-sectional and transactional allocation of surplus in support of an investor protection mission. Moreover, in response to D.C. Circuit cases on economic analysis in SEC rulemaking, staff at the agency have explicitly identified a number of justifications for adopting rulemaking. These include correcting market failures of the

209 See, e.g., Fletcher, supra note 116, at 13.
210 Verret, supra note 165. See also, e.g., Austin Powers, International Man of Mystery (1996).
211 Congress has authorized the SEC to adopt rules “as necessary or appropriate in the public interest and for the protection of retail customers” relating to “the legal or regulatory standards of care for brokers, dealers, investment advisers,” and their associated persons. Dodd-Frank Act § 913(f). The SEC relied on this authority in adopting Reg BI. See 84 Fed. Reg. at 33330 n. 122. Congress has likewise instructed the SEC, when adopting rules for the “public interest” and not merely for the protection of investors, to consider goals of “efficiency, competition, and capital formation.” Nat’l Secs. Mkts. Improvement Act of 1996 (“NSMIA”), Pub. L. No. 104-290, § 106(a)(2), 110 Stat. 3416, 3424 (1996). The D.C. Circuit has said that in considering the public interest, the SEC has a “statutory obligation to determine as best it can the economic implications of [a proposed] rule.” Chamber of Com. v. SEC, 412 F.3d 133, 143 (D.C. Cir. 2005). The SEC is less constrained when also adopting rules for the protection of investors. Verret, supra note 165. (comparing the SEC’s obligations when rulemaking for investor protection as compared to the public interest, and noting that “[t]he fact that a single firm or handful of firms’ business models will be negatively impacted is not a relevant cost for Commission consideration” and may even be considered a benefit).
sort identified here.212

B. Undesirable or impractical regulatory interventions

In responding to behavioral design, securities law need not draw on a blank slate. Scholarship on law and behavior has identified a number of prototypical regulatory interventions, like mandatory disclosure, responsible use devices, counter-addictive design, and bans on dangerous features.213 I look here at some ineffective or unrealistic ideas, then in Part III.C address some more attractive alternatives.

1. The false promise of mandatory disclosure solutions.

Law often adopts labeling or mandatory-disclosure solutions to behavioral design technology. It is an attractive intervention in securities law, in which disclosure is the favored idiom.214 As with warning labels on packs of cigarettes, regulators can plausibly require labeling or disclosure to better inform consumers and de-bias their consumption choices.215

This is likely to be an ineffective solution because we already have mandatory disclosure of the underlying payment arrangements that give rise to the conflict of interest driving behavioral design. Broker-dealers have to deliver to retail customers at the beginning of the relationship a client relationship summary on Form CRS, which mandates disclosure of underlying conflicts of interest.216 There are other disclosure requirements outside Form CRS, too. Rule 10b-10 under the Securities Exchange Act of 1934, for instance, requires a broker-dealer to send clients trade confirmations with information about their receipt of PFOF and how the client can learn more.217 Broker-dealers must also publicly report transactions.
they route to other venues for execution.  

These rules already require significant disclosure about the business model. This is not to say more disclosure would be unwelcome; what is disclosed remains spotty, and in the case of trade confirmation notices comes too late to bear on the decision to enter into an irreversible transaction. Form CRS, moreover, mandates disclosure of the conflict interest while implications that may be materially important to investors—the behavioral design choices that flow from the incentive—remain left unsaid. But there are reasons to worry that retail investors will not adequately consume these disclosures. If disclosures are not salient and there are too few consumers on the margin selecting on the disclosures, they are unlikely to move the market. But as existing disclosure rules have not moved the needle, regulators should not rest on disclosure solutions alone.

2. Mandatory downtime and other behavioral interventions.

Another regulatory technique is to require monitoring of customer use patterns and intervening in problematic use with warnings, salience shocks, or mandatory downtime. Through the same mechanism as behavioral design, consumer financial behavior might be manipulable through just-in-time interventions. Warnings, salience shocks, and downtime might focus attention to nonsalient attributes they are overlooking.

certain communications with retail customers information about the role of payment for order flow in its business model, and made false claims about its order execution quality. See Robinhood Financial, LLC, 2020 WL 7482170, at *7-9.

---


220 Form CRS, supra note 216. Robinhood, for instance, discloses that “it earns revenue from your trade activity and therefore has a monetary incentive for you to trade more.” Robinhood Financial LLC Form CRS 2 (June 9, 2021), https://perma.cc/5MGW-Z2HW.


222 See supra note 95.

223 Dombalagian, supra note 106, at 10.

224 See Langvardt, supra note 97, at 154.

In general, securities law has not adopted salience shocks. But it is instructive to look at a modest mandatory-downtime intervention relevant to retail investors. 226 “Pattern day trading” is a risky activity involving more than four “day trades”—roundtrip purchases and sales of the same security on the same day—withina five-day period in an account financed with margin. 227 Pattern day traders try to profit off price momentum, buying low and selling high after short holding periods. In these cases, regulators’ primary concern is in the day trader’s use of borrowed money for intraday trades. 228 Pattern day-trading rules intervene by limiting margin access and buying power, rather than by impose mandatory downtime at the level of the behavioral prompt. 229

We could take this intervention one step further. Brokers do not have an ongoing obligation to monitor customer accounts. 230 Securities law could require broker-dealers to monitor client transactions to determine whether some threshold had been reached. 231 Yet professional proprietary traders would not want to be covered in such a regime. Regulators would face difficult definitional problems defining the population to which transaction monitoring duties would apply in self-directed accounts. Defining it in the same way as Regulation Best Interest defines “retail customers” would impose a flat duty across the industry to monitor

---

226 There are other cooling-off periods. Exchange Act Rule 10b5-1 authorizes corporate insiders to adopt preset plans for trading. See 17 CFR 240.10b5-1. But the structure of the rule permitted insiders to set up and cancel plans opportunistically, and researchers found evidence that insiders were doing so. See, e.g., David F. Larcker, et al., Gaming the System: Three “Red Flags” of Potential 10b5-1 Abuse, Stanford Closer Look Series (Jan. 19, 2021). The SEC has proposed amendments that would implement a cooling-off period after adoption of a 10b5-1 plan. See Proposed Rule, Rule 10b5-1 and Insider Trading, Securities Act Release No. 11013 (Dec. 15, 2021).


228 Margin is typically calculated based on end-of-day holdings, but day trading exposes brokers to financial risk even if traders close out their holdings and have a flat account balance at the end of the day.

229 To mitigate this risk, securities law requires pattern day traders to post $25,000 minimum equity in their margin accounts, limits their day-trading buying power, and subjects them to further restrictions if they exceed buying power and do not meet a margin call. See, e.g., FINRA Rule 4210(f)(8) (pattern day trading rule); Order Approving Proposed Rule Changes Relating to Margin Requirements for Day Trading, Exchange Act Release No. 44009, 66 Fed. Reg. 13,608 (Mar. 6, 2001).


231 Broker-dealers have certain duties to know their customer, to know the pattern of orders, to have supervisory policies and procedures related to suitability, and the like. This is not the same as an ongoing duty to monitor a self-directed account, but it has inched the obligation in that direction. Bullard, supra note 171, at 359–60.
the accounts of retail customers. Any more restrictive definition would face difficult line drawing problems that regulators have already failed to navigate once.\textsuperscript{232} Besides that particular problem, even the broader regulatory technique would raise line-drawing questions about when to trigger mandatory downtime based on the excessiveness of trading.

Regulators might also look to lessons from comparative securities law. China’s securities exchanges have responded to concerns about “excessive” speculative trading by prohibiting same-day round-trip transactions in certain kinds of securities, known as the T+1 trading rule.\textsuperscript{233} Empirical studies of intraday speculative trading in Chinese capital markets indicate that this may reduce trading volume and price transparency.\textsuperscript{234}

3. Counter-addictive design.

A third regulatory response involves purposeful mechanism design that seeks to reduce investors’ propensity to engage in trading. If zero commission pricing elicits excessive trading that has undesirable social welfare effects, and gamification is simply a gloss

\textsuperscript{232} That particular problem is illustrated by the story of the “SOES bandits.” Market makers in NASDAQ were required to give preferential electronic access to retail broker orders of 1,000 shares or fewer through the Small Order Execution System (“SOES”). See 56 Fed. Reg. 52092 (Oct. 17, 1991). A cottage industry of direct-market-access discount brokerages gave freelance traders (the SOES bandits) access to SOES, creating risk for market makers of adverse selection on pricing. This strategy shifted trading profits from market makers to the SOES bandits. See Jeffrey H. Harris & Paul H. Schultz, The Trading Profits of SOES Bandits, 50 JOURNAL OF FINANCIAL ECONOMICS 39, __ (Oct. 1998). In response to market makers’ complaints that freelance traders were using SOES to earn riskless arbitrage profits at the expense of market makers with stale price quotations, the SEC approved a rule that (among other things) defined professional traders and prohibited them from using the SOES system. See Exchange Act Release No. 29809 (Oct. 10, 1991), 56 Fed. Reg. 52092 (Oct. 17, 1991). In sustaining a vagueness challenge to the rule, the D.C. Circuit emphasized the definitional problem: “a trader would be hard pressed to know” when the number of trades had passed the line into being a “professional” – putting the trader “in danger of triggering an adverse reaction from the NASD.” Timpinaro v. SEC, 2 F.3d 453, 460 (D.C. Cir. 1993). Among other factors the court found objectionable were references to “excessive” trading. \textit{Id}. In remanding the rule to the SEC, the court directed the agency to adjust the professional trading pattern definition in ways that provided more guidance and less vagueness. For the rule on remand, see Exchange Act Release No. 33377, 1993 WL 534173 (Dec. 23, 1993).


on top of the pricing, then regulators might seek to address that root problem.\textsuperscript{235} For the analogous problem of addictive technology, scholars have identified “counter-addictive design” as a class of possible regulatory responses that “mitigate the habit-forming effects of persuasive design,” such as by imposing “some degree of transactional friction.”\textsuperscript{236}

Transactional frictions are familiar if underused tools in securities regulation.\textsuperscript{237} Such frictions might take the form of minimum commission pricing. Stock brokerage commissions were fixed until deregulation in 1975 brought about competitive pricing. It was not long after that economists began examining transactional frictions in potentially excessive speculative short-term trading in securities, noting that securities transaction or stock transfer taxes might be a possible solution.\textsuperscript{238} Surveying the debate about excessive trading in 1995, Paul Mahoney noted that transfer taxes could implement transactional frictions against noise traders’ excessive speculation.\textsuperscript{239} If excessive speculation through securities trading substitutes for gambling, these might be analogous to excise taxes on gambling.

Even if they worked, however, we should not as a practical matter anticipate that legislators or regulators will adopt minimum commission pricing. Financial transaction taxes have been a staple in recent progressive legislation in Congress for different purposes.\textsuperscript{240} But these efforts have also been unsuccessful. The political economy faces headwinds, too: it would be “politically terrible” to require


\textsuperscript{236} Langvardt, \textit{supra} note 97, at __ (discussing counter-addictive design).

\textsuperscript{237} A recent example familiar in securities regulation involved the stock exchange IEX, which sought to impose transactional frictions in the form of a “speed bump” in its matching engine to cut down on this kind of latency arbitrage. See, e.g., \textit{Application of Investors’ Exchange LLC for Registration as a National Securities Exchange}, Exchange Act Release No. 78101, 81 Fed. Reg. 41141 (SEC June 23, 2016); see also MacKenzie, \textit{supra} note 107, at __ (describing conflict between IEX and high frequency traders reflected not just “law and political economy,” and “what the purposes of share trading should be,” but a physical “reconfig[uration of] at least a small part the technological system of U.S. share trading”).


\textsuperscript{239} Mahoney, \textit{supra} note 70, at 714.

brokers to move from “free” to nonzero commissions. Modern securities law is quite unlikely to adopt minimum commission pricing, no matter its merits.

4. Ban on dangerous features: “Confetti regulation”

Securities law does not directly regulate features trading apps must have. One solution is command and control regulation of app design, requiring it be dull and monotonous. To those who consider “design” the objectionable aspect of gamification and behavioral design, banning software design regulators disapprove of is a superficially easy solution. But in a forthcoming essay in the Yale Law Journal Forum, Kyle Langvardt and I have argued that whatever the social welfare case for addressing gamification, regulators should avoid “making it about the software.” Confetti regulation would be hard to design, and also to justify; how much confetti is too much? In addition, the more regulatory responses look like direct command and control regulation of software, the greater the litigation risk under the First Amendment theories from the technology bar. The Supreme Court’s First Amendment jurisprudence is increasingly oriented toward shielding the Court’s favored groups—businesses and religious adherents—from regulation in the public interest. Given second-order effects of such challenges for other socially important aspects of securities law, we have argued that regulators should avoid directly regulating expressive aspects of app design. Instead, they should attempt to target the underlying harm: modestly expressive design choices that encouraging financially irresponsible trading behavior.

5. Ban on dangerous features: “Excessive trading” theories.

Another idea is to simply ban “excessive” trading. Gamification is objectionable, but is secondary to the harm from maladaptive trading, so trading is the natural target. The problem with this

---


242 The same concerns might arise if FINRA were to mandate “actionable design guidelines for retail investing applications.” Chaudhry & Kulkarni, supra note 35, at 785.

243 Langvardt & Tierney, supra note 15, at ___. Ann Lipton has illustrated the definitional problem with reference to a similar provision of Regulation Crowdfunding, which identifies “objective criteria” that crowdfunding platforms can rely on in deciding to “highlight offerings on the funding portal’s platform.” 17 C.F.R. § 227.402(b); see Lipton, supra note __ (noting that the definitional problem is “not easy to resolve”); Final Rule, Crowdfunding, 80 Fed. Reg. 71387, 71463 (Nov. 16, 2015).

approach, however, is that excessiveness is in the eye of the beholder. What’s excessive will rarely be evident on the ground. So these proposals become efforts to divide “risk preferences” traders into categories of traders whose activity we approve of or don’t: professional or semi-pro traders on one side, and retail traders on the other—an unflattering inquiry.245 If we do not proxy excessiveness by professional status, the question is how to articulate a manageable definition of “excessive” trading. Quantitative suitability case law gives us a number of mathematical measures, like portfolio turnover ratios.246 But Timpinaro’s legacy is to caution some skepticism that it’s possible to surmount definitional problems in excessive-trading rules.

C. More realistic regulatory interventions

There are more promising options than the ones we have just considered. This Part III.C considers regulatory interventions including fiduciary duties, existing and expanded tools under Regulation Best Interest, and more ambitious efforts to reform market structure problems that give rise to incentives toward behavioral design.

1. Fiduciary-duty theories.

Another popular ban on dangerous features involves linking behavioral design to the quality and nature of relationship between broker and client. Ordinary sales relationships are known for sharp dealing, and sales representatives in most industries do not owe special duties to their customers. This reflects the intuition that commercial strategies meant to activate or alter consumers’ behavioral or cognitive processes, and eliciting behavior that generates private profit, might be the proper subject of unfair trade or other bodies of regulation—but not the heightened duties of fiduciaries.247

245 Securities law’s uncertainty about retail investment shows up in access to restricted markets. It uses a similar distinction in defining “accredited investor” status for investing in private companies. See Regulation D Rule 501(a), 17 C.F.R. § 230.501(a). That status sweeps in institutions and the sufficiently wealthy, or certain other groups thought to be sufficiently sophisticated to fend for themselves. This definition has been criticized for some time for over- and under-inclusiveness and, despite recent amendments, remains contested to this day. See Final Rule, Accredited Investor Definition, Securities Act Release No. 10824, 85 Fed. Reg. 64234 (Oct. 9, 2020). This illustrates the difficulty with dividing investors based on proxies for ability to bear risk without financial ruin.


247 Fiduciary relationships are those involving one with special access or intimate influence
Securities law has long grappled with whether brokers are more like mere salespeople, who do not owe fiduciary duties to their customers, or more like investment advisers, who have more of a confidential advisory role with their clients. But the distinctions between the kinds of financial advisory relationships are often blurry. At common law, brokers were not fiduciaries, except when that status sprung from some aspect of the relationship suggesting that the client needed the additional protection of the law.\(^{248}\) The Dodd-Frank Act built from that common-law baseline, directing the SEC to examine whether to harmonize the duties that brokers and RIAs owe to their customers.\(^{249}\)

Regulation Best Interest was the product of long negotiations over the extent to which the SEC should in fact harmonize those duties or subject brokers to a lighter duty to clients.\(^{250}\) One objection to Reg BI is that it did not go far enough in this respect, implying that regulators might address this unfinished business.\(^{251}\) Reg BI was adopted by an SEC dominated by Republican appointees, and the shift to an SEC dominated by Democratic appointees may bring fresh scrutiny to whether Reg BI should be extended in this or other regards.\(^{252}\)

But fiduciary duty theories may have some traction in addressing behavioral design even if the SEC does not continue to harmonize the BD and RIA standards of conduct. In a multi-enforcer system and absent preemption, one solution to perceived inadequacy of federal law is to level-up state law.\(^{253}\) Several states have considered

\(^{249}\) See Dodd-Frank Wall Street Reform and Consumer Protection Act § 913.
\(^{251}\) In October 2021, the director of the SEC’s Office of the Investor Advocate told an industry conference that DEPs “blur the line” between brokerage and investment advice, and that if the SEC “fails to brighten the distinction between advisers and brokers, it will make little sense to regulate the two with such distinct regulatory models.” Rick A. Fleming, Speech, Remarks at SEC Speaks – Investor Protection in the Age of Gamification: Game Over for Regulation Best Interest? (Oct. 2021).
adopting broker fiduciary rules in response to Regulation BI. Massachusetts, for instance, has had both common-law rules governing when broker-dealers are fiduciaries, as well as state-law conduct regulations applicable to broker-dealers registered to do business in Massachusetts. In 2020, its state securities regulator amended those regulations to impose an across-the-board fiduciary standard beyond what the common law rule would have covered. And in December 2020, it brought an administrative enforcement proceeding against Robinhood, alleging that it violated the new fiduciary standard by engaging in gamification. Robinhood has challenged the underlying rules, arguing that federal law preempts state regulators from adopting the rule, and that in any case a state agency could not on its own change the state’s common law. In adopting these rules, Massachusetts secretary of state Bill Galvin (its longtime securities regulator) has effectively dared the state Supreme Judicial Court to approve an extension of state fiduciary law past both what the common law and the SEC had recognized applies to brokers.

The main implication for us is that fiduciary theories are a plausible regulatory response to behavioral design. Behavioral design might be understood as a breach of heightened duties arising out of a fiduciary relationship. The traditional common-law bases for assigning fiduciary status to a broker typically involved firms that were trying to earn rents in nonsalient ways by manipulating people’s trading—in discretionary accounts, in the accounts of people who lacked capacity to manage their affairs, or in the accounts of people who blindly accepted recommendations without further thought. These theories offer a readymade basis rich with common law support for going after broker-dealers that target children and other investors who lack legal capacity to participate in

(1) (explaining that in a federal system in which states can build from a federal-law baseline, “it should be unsurprising” to see states adopt “welfare maximizing” rules).


255 See supra notes 64.


257 See Dan Seal, Robinhood Fight Will Test Mass. Securities Chief’s Authority, LAW360 (May 7, 2021), https://www.law360.com/securities/articles/1378416. For the argument that federal law neither expressly nor implicitly preempts these regulations, see Vaz Ferreira, supra note 64, at 579–83.
risky speculative asset markets. But we also shouldn’t overstate their promise, especially at the state level. These fiduciary claims remain state law, limiting their scope until the SEC completes the unfinished work of Dodd-Frank in harmonizing the broker-dealer and investment adviser standards of conduct.

2. Regulation Best Interest and “behavioral churning.”

One of the more attractive “ban on dangerous features” option is to treat behavioral design, including engagement practices and personalization algorithms, as implicit recommendations under the securities laws. This approach can be implemented in part under existing law, though some changes may have to be made around the margins.

SEC and FINRA rules have long imposed obligations on broker-dealers in connection with the making of recommendations. Under suitability doctrine, FINRA historically required broker-dealers to have a reasonable basis for believing that any recommended security was suitable for the client, under the facts and circumstances. In 2019, the SEC adopted Regulation Best Interest, which built on existing suitability rules. Reg BI applies when broker-dealers make “recommendations” to retail customers, and in those circumstances requires them to act in clients’ best interests. One component of the Reg BI duty of care is known as “quantitative suitability.” Under this component of the duty of care, broker-dealers in making recommendations must have a reasonable basis for believing that a series of recommended transactions—even if in the retail customer’s best interest when viewed in isolation—is not excessive and is in the retail customer’s best interest … and does not take the financial or other interest of the broker … ahead of the interest of the retail customer.”

Scholars and industry participants alike have noted that Reg BI gives the SEC existing tools to address at least some objectional facets of behavioral design. A broker that makes recommendations to

258 Other than baseball cards.
259 See, e.g., FINRA Rule 2111.
261 For instance, John Coffee and Ann Lipton have each observed that Reg BI’s duty of care would apply to DEPs that constitute “recommendations.” Coffee, supra note 163; Ann Lipton, Robinhood’s Interface, BUSINESS LAW PROF BLOG (Feb. 5, 2021), https://lawprofessors.typepad.com/business_law/2021/02/robinhoods-interface.html. The brokerage industry trade association, SIFMA, has likewise urged the SEC to rest on existing law, treating DEPs either as “recommendations” under Reg BI or as residual categories of educational or marketing communications. SIFMA, supra note 159, at __.
elicit noisy retail order flow for its own profit, and without regard to the retail clients’ best interest, would violate the duty of quantitative suitability. But absent a “recommendation,” Reg BI’s duties do not apply.262 This heightens the stakes of categorizing design features as “recommendations” — and raises a broader line-drawing problem about design features that “bring certain items to the customer’s attention.”263

In our essay On Confetti Regulation, Langvardt and I observed that many behavioral design features plausibly fit within the existing legal category of “recommendation.”264 The SEC does not like to get pinned down on issues like the definition of a recommendation, so it judges them with a malleable facts-and-circumstances standard.265 The factors that bear on whether a communication is a “recommendation” are nonetheless well known, and “include whether the communication ‘reasonably could be viewed as a call to action’ and ‘reasonably would influence an investor to trade a particular security or group of securities.’”266 The level of tailoring to the particular customer also bears on status as a recommendation.267

The “recommendation” standard is not as uncertain as it appears. Securities regulators have articulated decades worth of rules and guidance about when brokers’ presentation of information—including in online communications with customers—might be a “recommendation.” Some behavioral design features fit easily within that category, like recommendation algorithms. Yet Regulation BI’s application to “recommendations” reflects a deeper

262 Cf. Libin & Wrona, supra note 246, at 614 (citing NASD Notice to Members 96-60, Clarification of Members’ Suitability Responsibilities Under NASD Rules with Special Emphasis on Member Activities in Speculative and Low Priced Securities, at *3 (Sept. 1996)).

263 Lipton, supra note 261.

264 Langvardt & Tierney, supra note 15, at __.

265 According to Reg BI’s adopting release, “what constitutes a recommendation is highly fact-specific and not conducive to an express definition,” and thus the SEC would continue to follow the “existing framework” for defining a recommendation under suitability doctrine. Final Rule, Regulation Best Interest: The Broker-Dealer Standard of Conduct, 84 Fed. Reg. 33318, 33335 (July 12, 2019) (“Reg BI Adopting Release”). The SEC is reluctant to give greater certainty, as it is concerned with not creating a roadmap for evasion.

266 Id.

267 Id. (noting that “[t]he more individually tailored the communication to a specific customer or customer segment, the greater the likelihood that the communication is a recommendation”). To this point, some broker-dealers appear to use algorithms that tailor what information is presented to encourage engagement with the particular client. Other algorithms tailor information to the cross section of the broker’s clients, as in a list of securities in which there is the highest volume of buy and sell orders from the broker’s customers. Machine learning, AB testing, and related efforts to fine-tune recommendation algorithms have become increasingly integral part of consumer-facing applications as companies try to wring out greater efficiency from their consumer contacts.
if largely unarticulated orientation toward broker conduct that increases salience of securities to traders deciding to make a transaction. Some salience is unavoidable, as some information will be presented to an investor by default. And it is somewhat unnatural to think of most behavioral design features in terms of recommendations—“calls to action”—to buy, sell, or hold a particular security. Many are more naturally thought of as inducements to trade generally. That question becomes more complex, however, when these practices are combined with data analytics that targets particular users with content that will call them, more than others, to action.268

The more that algorithms and personalization are tailored toward presenting this kind of information, and the more that information correlates with greater sources of revenue for the broker, the more easily it is characterized as a recommendation. Indeed, a policy statement issued by FINRA’s predecessor NASD in 2001 suggests that many of these activities may qualify as recommendations for purposes of the suitability rules.269 This is not to suggest that any particular behavioral design practice is a recommendation. As in most areas of securities law, the devil is in the details.270 So securities regulators will have to grapple with the


270 But one thing is clear: it doesn’t matter that a broker tells its customers that it is not making recommendations. See, e.g., William H. Murphy & Co., Inc., Exchange Act Release No. 90759, 2020 WL 7496228, at *10 (SEC Dec. 21, 2020) (holding that “a disclaimer that a communication is not an offer to sell securities . . . cannot alter the character of [the] solicitation of interest”); Kenneth R. Ward, Exchange Act Release No. 47535, 2003 WL 1447865, at n.47 (SEC Mar. 19, 2003), aff’d, 75 F. App’x 320 (5th Cir. 2003). Securities law doesn’t recognize this kind of “ceci n’est pas un pipe” defense. Cf. René Magritte, The Treachery of Images (1929). Indeed, FINRA’s rules provide that “a member cannot avoid or discharge its suitability obligation through a disclaimer where the particular communication reasonably would be viewed as a recommendation given its content, context, and presentation.” Suitability Rule and Online Communications, Exchange Act Release No. 44178, 66 Fed. Reg. 20697, 20700 (Apr. 24, 2001) (filed by FINRA’s predecessor NASD with the SEC). In pre-Reg BI articulations of its suitability rule, FINRA prohibited
contours of what constitute recommendations, as well as the role of existing and new doctrines in addressing the plausible harms from gamification features. But as this paper shows, they do not write on a blank slate.

Kyle Langvardt and I argued in On Confetti Regulation that behavioral design reflects a new variant on “churning,” an old and familiar problem in securities law.271 Brokers have incentives to cause excessive trading in a customer account to increase compensation.272 In responding to that incentive, securities law already reflects a particular normative policy about retail investors and broker dealers. It discourages broker-dealers from eliciting overconsumption of expected negative net present value transactions by those who do not know better and are discouraged from learning better.

Churning and the Reg BI duty of care as to quantitative suitability are prospective legacy devices for regulating these potential problems from gamification. These doctrines might be sufficient — on their own or in connection with other doctrines — to handle the problem of behavioral churning. But they also involve tradeoffs between reactive principles-based enforcement and proactive rulemaking, with sobering implications for the effectiveness of regulatory policy in this area.273

broker-dealers from “disclaim[ing] any responsibilities under the suitability rule.” FINRA Rule 2111.02. The SEC described this non-disclaimer rule as part of the “regulatory baseline” and “existing framework” to which Reg BI added.

See Langvardt & Tierney, supra note 15, at __.

272 Churning is “a conflict of interest in which a broker or dealer seeks to maximize his or her remuneration in disregard of the interests of the customer.” 8 LOSS ET AL., supra note 85, at 475; see id. at 471-72 (noting that churning “may violate federal and state securities fraud provisions, the former Rules of Fair Practice, … any pertinent securities exchange rules, … common law fraud or breach of contract,” and Exchange Act rules); see, e.g., Mihara v. Dean Witter & Co, Inc., 619 F.2d 814, 820 (9th Cir. 1980) (“Churning occurs when a securities broker engages in excessive trading in disregard of his customer’s investment objectives for the purpose of generating commission business.”). Traditionally the churning theory applied where the client had given the broker discretion over trades in an account, but also where the “customer routinely accepts the broker-dealer’s recommendations typically because the customer is naive, unsophisticated, or inexperienced.” Id. at 476 (explaining that “the real issue is whether the investor was capable of independently evaluating the recommendations”). FINRA codified churning doctrine in its quantitative suitability requirement under its Rule 2111, then proposed to eliminate the control element. See Notice of Filing of Proposed Rule Change to FINRA’s Suitability, Non-Cash Compensation and Capital Acquisition Broker (CAB) Rules in Response to Regulation Best Interest, Exchange Act Release No. 88422 (Mar. 19, 2020). In Reg BI, the SEC codified the broker’s duty of care not to make quantitatively unsuitable recommendations, and applied this duty regardless of whether the broker has actual or de facto control over the account.

Recent regulatory reforms have sharpened the toolkit under Reg BI in ways that naturally lend themselves to framing the harm as self-directed churning. But the main wrinkle is that Reg BI is triggered in the event of a “recommendation” to a retail customer, heightening the stakes of that legal categorization. It does not “apply to self-directed or otherwise unsolicited transactions” absent a related recommendation.274 SEC Investor Advocate Rick Fleming has highlighted that some DEPs, possibly including some behavioral design features, “may blur the line between solicited and unsolicited transactions.”275 And that highlights a potential gap in Reg BI that the SEC could fix. If brokers elicit order flow subtly through behavioral design, the legal status of the broker’s obligations “should not turn on whether the customer technically initiates the trades after” experiencing the behavioral design feature.276 If the doctrinal concept of a recommendation is insufficient to implement the social welfare case for regulating behavioral design, the SEC should revisit the deal struck in Reg BI.

3. Gatekeeping, supervisory, and compliance

I have examined some existing regulatory tools that are common to other areas of broker-dealer regulation. But there are other options for expanding the regulatory toolkit, too. Other than examples suggested by Langvardt’s framework, regulators have proposed additional responses to concerns about gamification. FINRA has alerted member firms to the possibility that they will be examined for compliance with supervisory rules requiring adequate policies and procedures that might be implicated by gamification.277 It might be preferable for regulators to conceive of the problem of one as supervision, compliance, and knowledge about customers. Securities regulators rely on these tools to fill gaps where substantive regulations do not exist.

4. Market structure interventions

Other options are less modest in their ambition. Some scholars and consumer advocates have called for Congress to prohibit the practice of payment for order flow, on the notion that this will reduce

274 See Reg BI Adopting Release, 84 Fed Reg. at 33335.
275 Fleming, supra note 251.
276 Id.
the first-order harms that come from excessive noisy trading.278

But the most ambitious “fix” is to attack the underlying market structure problems that have encouraged these practices to emerge.279 If market fragmentation and continuous time nationally best market pricing have created undesirable opportunities for the arbitrage that makes gamification profitable, then regulators might attack those structural issues instead of the app design that inexorably flows from it. These flaws in the national market system have been known for years. Among the salient problems: it encourages an all-out arms race in investments in technological speed (at the physical limits of communications infrastructure). That arms race is socially costly, as it diverts investment from the real economy into efforts to shave miniscule rents from improvements in intermediation, liquidity, and price transparency. Scholars have suggested that a solution to this arms race is to switch from continuous time pricing to periodic batch auctions.280

This final category of alternative regulatory technique, I suggest, offers advantages over others. It gets at the root cause rather than the app design that is a symptom. It promises to shift the attention of intermediary firms, and their decisions about how to allocate capital, away from wasteful competition over increasingly smaller fractions of a penny in serve of liquidity and price transparency. And it sharpens legislators’ and regulators’ focus on dismantling one of the pernicious second order effects of the national market system, which left unchecked reinforces the primacy of liquidity and price transparency over other visions of what securities law should try to accomplish. Not allocating capital to its highest value uses, or smoothing consumption over time—but encouraging trading at the sacrificial altar of the market.

IV. NORMATIVE AND THEORETICAL IMPLICATIONS

This Part IV addresses some of the broader implications of the social-welfare case for regulating gamification, and responses to some claims about those implications. I address the techno-skeptic idea that this is going to reduce our public confidence in capitalism; the techno-populist claim that this will increase public participation


279 As John Coffee suggested in an op-ed, a “major redesign of market structure” would “face the most organized resistance.” Coffee, supra note 163.

280 See, e.g., Budish et al., supra note 105; Roberto Ricco and Kai Wang, Frequent Batch Auctions vs. Continuous Trading: Evidence from Taiwan (Jun 2021).
in corporate governance and investing more broadly; and the techno-optimist claim that behavioral design can be harnessed for good. I also offer some thoughts about the tradeoffs that securities regulation is making under the status quo between investor protection and the production of other important things like liquidity and price discovery.

A. Techno-skepticism: access and confidence in ludic capitalism.

One set of objections to behavioral design can be described as broadly techno-skeptical. In this view, behavioral design and gamification are bad because they undermine confidence in markets as institutions. There is a superficial sense in which encouraging people to treat investing “as a game” makes it appear less serious, and reduces the “salience of the risk of a significant drawdown of capital, and the resulting loss.” There is also a deeper concern that making investing like a game signals some lower social value from speculation—that it is in some sense a game played by Wall Street with a deck stacked in its favor.281

The assumption underlying these claims is that we ought to reinforce public confidence in markets as mechanisms for allocating capital to high value uses. Yet our confidence in markets should reflect whether price mechanisms reflect reality. And the concern that turning finance into a game “obscures the connection between price and value, fueling the phenomenon known as meme stocks,”282 reverses the causal arrow. Asset markets have for some time experienced a disconnection between price and “value,” at least as it is measured by traditional normative finance. Meme stock trading reflects that people understand and celebrate a disconnect between price and value—and now they can finally play it as a game, just as if they had $1,000-a-month Bloomberg terminals too. In this view, social media has permitted the kind of coordination needed to produce for herding traders returns from divorcing price from what traditional normative finance “values.” Price and value have had a disjointed relationship in many asset markets for a long time, but the techno-skeptic worries that it’s a problem now that retail investors

281 See, e.g., Arjen van der Heide & Dominik Želinský, ‘Level up Your Money Game’: An Analysis of Gamification Discourse in Financial Services, J. CULTURAL ECON. 1, 2 (Routledge Feb. 2021) (noting that while some firms adopting gamification “explicitly embrace the label … , others … seem more reluctant to do so in public, most likely for the simple reason that it may undermine finance’s claims to be a productive activity”).

are involved. But it seems more desirable to spread public awareness of that disjoint and the forces that have produced it, than to carry on as if market failures do not exist. And while we can’t expect neoliberal capitalism to do anything but foster public support for markets as markets, we might also question how much effort society should invest in salvaging public confidence in an unceasing drive toward financialization.

Public confidence in markets may also be endogenous to other things, like wealth endowments. Financial commentators have predicted for some time that gamification will play an increasingly significant role in how financial advisers attract and retain clients who are engaged and motivated to achieve their financial goals. To one industry observer, a goal of “gamification” in financial services is to “rewire our brains and the way we engage emotionally by promoting new experiences that help to change investment habits and feelings.”

And according to some sociologists, even the discourse around gamification as a feature is meant to highlight risk to incumbent financial firms associated with generational wealth transfer and generational change in investing behavior.

This narrows in on a significant aspect of “gamification” discourse that reflects unease with a looming generational wealth transfer, and implied distrust that the transferees will be good stewards of wealth. By all accounts, millennials and younger traders are less wealthy than their parents’ generations were at the same age. They stand to inherit significant amounts over the next several decades in what has been called an unprecedented looming wealth transfer. To that end, many of gamification’s proponents in industry and scholarship have celebrated its role in engaging millennials. Describing this discourse of gamification, social theorists have suggested that it shapes incumbent firms’ and regulators’ views about the looming generational wealth transfer and the extent to which the business of “high earner, not rich yet” millennials will be up for grabs in years to come.

If these criticisms are right, it suggests gamification discourse

---

283 PAOLO SIRONI, FINTECH INNOVATION: FROM ROBO-ADVISORS TO GOAL-BASED INVESTING AND GAMIFICATION 142–43 (2016)
284 See van der Heide & Želinský, supra note 281, at 2.
285 “C’mon, mom, it’s just a few NFTs. No big deal.”
287 See, e.g., van der Heide & Želinský, supra note 281, at 6 (analyzing gamification narratives about “digital natives” and “multigenerational wealth transfer” to “millenials”).
288 See Id. at __.
means something different to industry and to regulators. That’s not a reason to ignore gamification, but rather to peel back the layers of the onion. Regulating gamification is a fight about capturing and distributing rents from market intermediation. Who benefits from noisy flow of retail investors, and who would benefit by capturing that flow? Efforts a decade and a half ago to privatize social security had a similar angle in permitting Wall Street to capture a significant stream of rents from retirement savers.

Focusing on the political economy of behavioral design in investing apps might also change our prescription. Our society has an interest in retirement and other kinds of social provisioning—to say nothing of an interest in discouraging wide disparities in distributions of wealth or of access to life chances. Unstable social provisioning for old age, let alone for smoothing consumption across the lifecycle, is destabilizing and impedes human flourishing. Securities law should encourage responsible planning for retirement and other financial goals in the public interest. An ambitious and public-interest-oriented securities law should not encourage bare engagement with markets without regard to second-order effects on market quality or other goods that we are trying to promote.

B. Techno-populism and the democratization of finance.

A second set of claims are optimistic that technology will usher broader and deeper participation by ordinary people in finance and business. These “techno-populist” claims emphasize technology’s role in mediating coordination among ordinary people in corporate governance and capital allocation. This has been an ambition of securities law scholars for decades: “technological change has some potential to democratize the securities markets.” But while these claims are not new, they have taken on new salience in an era of behavioral design. We ought not dismiss lightly the idea that behavioral design in investing apps might still have some role (desirable on its own terms) in broadening participation in equity markets. It’s easier to participate under zero commission trading in attractive, low-friction apps. But the techno-populist utopia faces significant headwinds.

Consider first the notion that gamified investing will encourage retail traders to participate in corporate governance. Shareholder voting has long suffered from a problem of retail investor apathy. It rarely is worthwhile for retail investors to participate in shareholder governance, given the usual collective action problem surrounding

---

289 Bradley, supra note 89, at 69.
research and monitoring for which the shareholder will internalize the cost but not all the benefits. As Ricci & Sautter have argued, however, social media may enable “affective” participation in mass coordination, a force that can plausibly be harnessed for prosocial corporate-governance ends.290 Lower costs of coordinating on social media, and through forums like the sub-Reddit /r/WallStreetBets, have made it easier for retail traders to engage in herding or momentum trades.291 These trades may also have expressive or affective dimensions. Traders participating in these strategies report being motivated by concerns about wealth inequality and disparate opportunities for different kinds of traders to earn returns in capital markets.292

This has led Ricci and Sautter to be optimistic that affective trading and mass coordination will overcome the typical barriers to retail participation in shareholder voting and corporate governance.293 But proponents of this aspect of re-retailization are mistaken, in my view, in thinking that gamifying corporate governance will lead to prosocial outcomes rather than just the same kind of wealth-extractive shareholder activism that has dominated corporate governance in the last 30 years. Much of that kind of activism has sought to maximize return to shareholders, with disastrous consequences across the real economy. Digitally mediated retail trading is just the newest form of activism: looking out for itself, mediated through Reddit rather than through pension and hedge funds. Even if social media encourages ordinary investors’ participation in shareholder democracy, it doesn’t follow that this improves social welfare if those shareholders’ preferences look different from the rest of society’s.294

Focusing on how behavioral design “democratizes” finance also underscores the already prominent role of financialization in our

290 See, e.g., Ricci & Sautter, supra note 4, at __.
291 This claim focuses on herding or momentum trades; naïve versions of these trades call for buying stocks that have recently had positive returns, and selling those that have not. These trades are popular because, by permitting people to get in to a momentum trade early and help construct demand for the trade, they offer a plausible “leg up” over the market to retail traders who typically lack any information advantage over other (typically institutional) traders.
292 See Jonathan R Macey, Securities Regulation as Class Warfare, COLUM. BUS. L. REV. (2021); cf. Winston, supra note 17, at *4 (describing how securities law shapes wealth inequality by gatekeeping investment opportunities with different return profiles).
293 See Ricci & Sautter, supra note 4, at __.
modern economy. But ownership and control are not just separated as a matter of corporate law, but practically also in the hands of a small minority. Edward Ongweso has described this as the “people’s delusion” about “democratizing” finance: it focuses on building a broad base of wealth (and, more abstractly, a broad base of democratic participation in governance of joint economic enterprise) through trading. But if people are trading for informationally noisy reasons, and especially if they are trading often, empirical research suggests that building wealth may not be in their future. And if active traders lose on average, and trade as a substitute for gambling, it might be undesirable to encourage this kind of “democratization.”

If this reading of the discourse is too abstract, look no further than Robinhood’s framing of its own service: “Robinhood’s mission is to democratize finance for all.” As with the band of outsiders led by highwayman Robin of Locksley, this suggests reallocation of surplus from rich to poor. While clever, this hides that the enterprise is about enticing unsuspecting travelers for a “free” visit so the highwayman’s real customers can take a nonsalient toll for the privilege. It would be one thing if democratized finance concept meant everyone had equitable access to ownership of equity


296 Id. (describing democratization of finance as “open[ing] up the casino to as many people as possible, while masking it in the language of universal stock ownership”).

297 Robinhood Compl., supra note 256, at ¶ 1.

298 See, e.g., ROBIN HOOD: MEN IN TIGHTS (Mel Brooks, dir. 1993).

299 Principal trading firms, in case this metaphor is too obscure.

300 This metaphor underscores the sociological criticism of gamification’s role in neoliberal capitalism. Democratizing finance disperses noise-trading labor in the markets, encouraging ordinary people to volunteer and discipline their labor toward generating the noisy volatility necessary to generate liquidity and price discovery in service of private profit. See, e.g., Kim & Werbach, supra note 32, at 160 (citing C.S. Rigby, Gamification and Motivation, in THE GAMEFUL WORLD: APPROACHES, ISSUES, APPLICATIONS 113 (Steffen P. Walz & Sebastian Deterding eds., MIT Press 2015)); cf. Eva Szalay, Retail Trading Frenzy Reflects “broken” US Equity Markets, Says XTX’s Gerko, FINANCIAL TIMES (Jun. 7, 2021). To another critic, gamification “appropriates non-alienated activity,” the things we spend time doing other than in exchange for wages, “and renders it useful to the capitalist goal of wealth accumulation.” P. Rey, Gamification and Post-Fordist Capitalism, in THE GAMEFUL WORLD: APPROACHES, ISSUES, APPLICATIONS 277, 280 (Steffen P. Walz & Sebastian Deterding eds., MIT Press 2015). See also, e.g., WOLFGANG STREECK, HOW WILL CAPITALISM END? 46 (verso 2016), (noting that “capital accumulation after the end of capitalist system integration hangs on a thin thread: on the effectiveness, as long as it lasts, of the social integration of individuals into a capitalist culture of consumption and production”).
interests in the means of production. But it doesn’t, and they don’t. To techno-populists, democratizing finance instead means that a greater number of people with surplus capital can put it to work in secondary markets for securities (and other speculative assets like crypto), the same way the rich do. Yet from the perspective of traditional finance, anyway, decisions to allocate capital in primary and secondary markets can lead to mispriced assets if made without regard to information relevant to a security’s payoff.

If behavioral design elicits this kind of noise trading, we might expect that the “democratization” function would tend to generate the kind of noisy, volatile speculation that generates profit to principal trading firms, rather than investment in economic coordination that will grow the real economy.

C. Techno-optimism and gamification as investor education

A third set of normative claims worth considering are techno-optimist. This view “celebrate[s] the problem-solving potential of gamification.” Behavioral design is desirable, in this view, because it can improve motivation and engagement with content or processes that people might otherwise prefer not to engage. It’s worth considering what is so seductive about behavioral design: that it might help build financial literacy from woefully low baseline levels. Meta-analysis of research has suggested that most financial-literacy interventions have weak explanatory value for observed financial behavior, may be weaker for lower-income

---

303 See, e.g., Edwards, supra note 150, at ___.
304 At risk of belaboring the metaphor: the undesirable result is to target a different kind of traveler, ripe to be skimmed passing through Sherwood Forest, than in the outlaw legend. This band of outsiders encourages the poor to give their money to the rich in an illusion of participating in the commonwealth. Meanwhile, the rest of King John’s England suffers from underinvestment. Cf. Wint (@dril), Twitter (Oct. 31, 2015), https://twitter.com/dril/status/660644922744262656 (“Sorry. Im sorry. Im trying to remove it.”).
305 van der Heide & Želinský, supra note 281, at 3. Sociologists van der Heide and Zelinsky, for instance, celebrate the promise to democratize finance. They identify two types of educative functions, one like the app Duolingo, in which “reward loops entice users progressively to learn,” while the other is like paper trading: “learning by simulation where users trade in highly stylized virtual stock market environments to gain ‘familiarity’ with the mechanisms of finance.”
306 See, e.g., Fairfax, supra note 118, at __.
groups, and may operate differently on the kind of behavior targeted by the intervention (like savings versus debt). To proponents of thoughtfully adopted behavioral design, by making work or education or some other domain of boring effort “fun,” we can encourage greater motivation and engagement among end users.

One of the SEC’s Commissioners, Hester Peirce, has promoted gamification’s potential in investor education on this basis. We ought not be concerned that investing is “too fun,” she told a legal reporter, because participation in the market is something securities regulators ought to encourage—along with “making sure that [investors are] getting information that’s really valuable in making good decisions or informing their questions.” Other proponents have noted this optimistic role for thoughtful design.

Techno-optimist claims like these suggest a plausibly promising role for gamification and behavioral design in closing gaps in financial literacy—and the risks that less financially savvy investors bear. Empirical research suggests “just-in-time” interventions may encourage financially responsible behavior. Given modest prospects of more foundational financial education efforts, regulators could encourage the use of “just-in-time” processes to drive motivation and engagement for specific purposes like improving financial literacy about particular financial products and services.

These techno-optimist claims are attractive because they promise to promote learning and to encourage better substantive financial outcomes, all with modest regulatory touch. Securities law


In a statement regarding an SEC enforcement action against a firm offering simulated day trading accounts with real payoffs, Peirce wrote that she had “reservations” about the expressive value of the enforcement action in “closing the door to these types of educational experiences.” According to her statement, “gamification of educational experiences can promote learning, and the use of awards or prizes—even cash prizes—can provide incentives to take the game seriously and thus increase the educational value of the experience.” Hester M. Peirce, Statement Regarding Tradenet Capital Markets Ltd. (Oct. 23, 2020); see Tradenet Capital Markets Ltd., Securities Act Release No. 10878 (SEC Oct. 23, 2020); see also Dean Seal, SEC’s Peirce Has “Reservations” About Recent Agency Action, LAW360 (Oct. 23, 2020).

See, e.g., Fielder, supra note 33.; Mike Lee, How gamification could take investor experiences to a new level, ERNST & YOUNG (Apr. 26, 2019).

See, e.g., Fernandes et al., supra note 307, at __.
relies primarily on information delivery through mandatory disclosure, yet one of the implementation challenges is in making sure that people consume the disclosures. We want people to read and understand them, if that is even an attainable goal. It might not be attainable, of course; securities disclosures are boring and complex, and people tend not to engage with them. If only we could gamify securities disclosures, according to the techno-optimist, we could encourage healthy financial behavior just as a child might earn stickers for doing chores without complaint.

But I will offer three reasons to doubt techno-optimist claims that gamification generates these outcomes. The first rests on the weakness of supporting evidence that these interventions have any sticky effect on substantive behavioral outcomes. Some studies have found evidence that gamification techniques can promote financial education. But what makes gamification so attractive from a business perspective is its modular applicability to new contexts: just add some leaderboards and badges, and you will have increased motivation among your users (and increased profits for your shareholders). But imagine for a moment your average human-resources compliance training module, perhaps one that awards you points for correct answers about whistleblower protection in the workplace. Superficial gamification, focusing primarily on easy-to-implement extrinsic rewards and incentives, is unlikely to build engagement and motivation in the long term. That is because those effects tend to dissipate once the extrinsic rewards are taken away. Triggering and activating intrinsic motivation is a much thornier problem requiring thoughtful design and implementation, though the problem is not insurmountable.

A second reason to doubt the techno-optimist claim is the real possibility that “positive” gamification efforts will backfire. To techno-skeptics, we ought not use technology to teach people that

---

312 See, e.g., Lauren E. Willis, Against Financial Literacy, 94 IOWA L. REV 197, 263-64 (2008); see also, e.g., Peter H. Huang, How Do Securities Laws Influence Affect, Happiness, & Trust?, 3 J. BUS. & TECH. L. 257, 300 (2008).


314 Some of the challenges are in making a game intriguing—in activating the same kinds of responses that make children want to play Minecraft for 12 hours straight. Replicating that same kind of intrinsic motivation in the educational context is not a matter of adding badges and notifications to facilitate disclosure, but building disclosure and information into a framework that provides a kind of intrinsic challenge, offers feedback, and encourages support and growth. See, e.g., Kevin Bell, Gameful Design: A Potential Game Changer, EDUCAUSE REV. (May 7, 2018); Rick Van Eck, Digital Game-Based Learning: Still Restless, After All These Years, EDUCAUSE REV. (Oct. 15, 2015); KAPP, supra note 29, at __.
finance is less risky than it is. Peter Huang has cited this as a reason against financial education that “treat[s] investing like playing a video game”: trying to make financial education “engaging, fun, and relevant” risks leading the audience to discount “the seriousness of investing and irreversibility of financial ruin.”

A final reason for doubt is that gamification might be normatively objectionable even if it has benefits to end users. Gamification and behavioral design involve interventions in our cognitive processes and decisionmaking in ways that seek to alter our behavior. Even where these processes are for prosocial and paternalistic ends, gamification still involves using people like means, a potentially objectionable basis on which to relate with others. By these lights, people may object to being subject to processes that are designed to be more addictive to them—making them feel trapped, like they have lost control—even if for prosocial ends.

These concerns should be serious to those who are empathetic to the promise of harnessing technology in these prosocial ways. Calibrating the right kinds of gamification, responsibly designed to generate engaging and intrinsically motivating experiences, is easier said than done. This justifies a healthy measure of skepticism that securities law can improve education and disclosure-delivery processes with “white hat” rather than “black hat” gamification.

D. Price discovery, liquidity, and the ends of securities regulation

A final normative implication of this analysis of behavioral design relates to the role of technology in generating non salient revenue streams: a kind of digital farming. Securities regulation was historically concerned about compensation in the form of commissions, as well as the kinds of conflicts of interest that this would generate. The emergence of a business model that gives rise

---

315 Peter H. Huang, supra note 312, at 302.

316 For examples of normative objections to gamification, see Tae Wan Kim, Gamification of Labor and the Charge of Exploitation, 152 JOURNAL OF BUSINESS ETHICS 27, __ (Sep. 2018); John Danaher et al., The Quantified Relationship, 18 AM. J. BIOETHICS 3, __ (Taylor & Francis Feb. 2018); Kim & Werbach, supra note 32, at __.

317 We should not expect that the market will produce this prosocial gamification on its own. The regulatory concern about behavioral design is that app designers exploit weaknesses in cognitive processes, not to build intrinsic motivation but because of a profit motive that responds to incentives within a fragmented market characterized by zero-commission retail trading. Without regulatory intervention, market-led efforts at gamification will prioritize engagement for profit over other learning-related functions like improving intrinsic motivation, because firms face a collective action problem in investing in learning and forgoing profit opportunities. On similar themes, see Dan Awrey, The Limits of Private Ordering Within Financial Markets, 34 REV. BANKING & FIN. L. 183, __ (2014–2015).
to nonsalient compensation, and equally important but less apparent conflicts of interests, raises tensions about what securities law is trying to accomplish.

That securities law has pushed broker-dealers toward arrangements that encourage a pool of noisy retail order flow illustrates its orientation toward particular ends. Investor protection is a core purpose of the securities laws, but so is the reproduction of orderly markets. The design of market institutions and rules evolves over time toward practices that reconstitute and reinforce markets as such. Many of the recent regulatory fault lines about the role of technology in capital markets reflect disagreement about the tradeoff between widespread price transparency and private profits for generating that transparency. Order book and pricing information is incredibly valuable to exchanges, and their sales of this information make up a significant fraction of their revenue. Trying to shave profits off that information is not itself normatively objectionable, or at least I don’t argue in this paper that it’s anything other than wasteful. What is objectionable, however, is the role that securities law has played in encouraging a system that tries to pursue the goals of liquidity and price transparency as ends in themselves, rather than as components of healthy markets oriented toward the public interest.

That reflects a deeper, contested view of what markets are for. In a more fundamentalist view, markets are good in their own right. But in a more skeptical view, they are only good as far as they are effective at producing and encouraging human flourishing. Digital engagement practices, behavioral design, gamification, recommendation algorithms, A/B testing: all of these are designed to generate the kind of informationally noisy engagement with capital markets that makes it valuable for dealers to try to do information arbitrage and promote price transparency. Of course, liquidity and price transparency are important services to provide in a continuous time geographically dispersed market by going up against the physical limits of infrastructure and improve. But as that market structure is not necessary, massive investments in arbitraging it seem to divert lots of attention and capital toward unproductive ends.

Should securities law prioritize technology’s role in producing valuable information given existing market structure and design, or should it reevaluate that structure and design? Eric C. Chaffee has noted securities law’s somewhat ambivalent stance toward accounting for new technology, and encouraged clarity and a light
regulatory touch to encourage technological innovation.\(^{318}\) However, securities law decides to intervene, it is certain to shape that development. Contrary to the usual view “that the technology of finance is independent of legal rules,” as Frank Pasquale has observed, “such rules are in fact a prime driver of technological developments in finance.”\(^ {319}\)

Technology is of course essential to constructing and stabilizing financial markets. It gives financial actors the ability to communicate, process, calculate, and do other things with vast reams of financial data. And technological innovation in this sense has always been in service of a project of production of price discovery or transparency—back to even before the days of the ticker tape.\(^ {320}\) As Alex Preda describes contemporaneous accounts of watching the stock market in the broker’s office around 1907, one’s “ability to watch and be in touch” with markets and pricing information “all the time was a key condition of playing the investing game.”\(^ {321}\) In this sense, retail participation in stock trading has had a gameful-play element since its earliest days—one that has always been interwoven with technological advances in price transparency.

Given the central role of technology—in how traders interact with posted bids and spreads, in how trades are crossed in matching engines, and in how high-frequency proprietary trading algorithms try to shave miniscule profits by arbitraging stale prices—to the maintenance of securities markets, it is puzzling that securities regulation has formally kept at arms-length technology as a regulatory object. In semantic analysis of SEC Commissioner speeches from 1935 to 2010, Juan Pablo Pardo-Guerra argues that regulators have increasingly framed technology as a kind of exogenous, “inscrutable force[] that acted upon markets with seemingly little possibility of control.”\(^ {322}\) The result is to naturalize


\(^{321}\) Alex Preda, Framing Finance: The Boundaries of Markets and Modern Capitalism 133 (2009).

\(^{322}\) Pardo-Guerra, supra note 318, at 271.
expectations among the regulated community, and among regulators themselves, about the role that law plays in constituting and constraining market forces.

CONCLUSION

Gamified brokerage apps make trading more fun. That will always be a problem for regulators who must face the headwinds for being spoil sports. There are plausible social welfare reasons, however, for regulators to prohibit or limit behavioral design and other digital engagement practices. As always, regulators should be cautious to tailor interventions consistent with empirical evidence. But in doing so, securities law should be attuned to cross-sectional differences in retail investors’ trading motives. Those differences may align with objections to behavioral design in investing apps in the first place, but are often overlooked.

Securities law has a number of techniques available for responding to behavioral design. Most promising are those that treat behavioral design as a recommendation, or that try to get at quantitative suitability. And while regulation of gamified investing is a salient problem, less salient are the market structure problems that gave rise to it and that it reinforces. If regulators want to be bold in addressing the problems that gave rise to gamified investing, they should reevaluate the aspects of market structure that make it profitable to stock a pond with noisy retail order flow.

That has real stakes, because retail investors can lose big by trading excessively. But it has higher order consequences for how we approach markets. While some techno-skeptics object that people will lose confidence in markets, that is in some sense inevitable. Across many markets asset prices regularly do not reflect fundamental value, if that can even be ascertained, and thus in a traditional finance sense these prices are inaccurate. Yet securities law encourages investment of massive sums toward prices that are precise in the form of continuously updated order books deep with liquidity and transparency across geographically dispersed execution venues in continuous time.

Retail traders don’t beat the market by trading actively. Securities law shouldn’t let brokers encourage retail traders to do so for conflicted reasons. It also shouldn’t succumb to the allure that it’s important to encourage this noisy trading to promote inaccurate but very precise pricing in stock markets. Especially not if it endangers the financial security of retail investors. By the same token, we ought to welcome greater skepticism toward the social functions of stock markets. If “meme stocks” reveal this disjointed problem with asset
pricing, that would be good for a popular understanding of what capital markets in late capitalism are even for.

There may be other arguments for regulating behavioral design, and there are a variety of doctrinal interventions for addressing the associated principal-agent, surplus allocation, and externality concerns. But a bold and modern securities law would also step in to address the market structure problem.