

Gamification and securities regulation

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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

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techno-optimists, -pessimists, and -populists about the broader effects of gamification on how retail investors engage with financial markets.

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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

² See Val Srinivas & Jill Gregorie, *The Rise of Newly Empowered Retail Investors: How They’re Changing Customer Expectations and Investing Dynamics* 1 (2021).

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”).

⁴ See, e.g., Sergio Alberto Gramitto Ricci & Christina M. Sautter, *Corporate Governance Gaming*, 22 NEV. L. REV. —, 5–10 (2021).

⁵ See *Id.* at —; Jill Fisch, *Gamestop and the Resurgence of the Retail Investor* (presentation at NBLSC, June 2021).

⁶ Brad M. Barber & Terrance Odean, *Trading Is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors*, 55 J. FIN. 773, — (2002).

⁷ See *infra* Parts I and II.B.1.

⁸ Brokers are those “engaged in the business of effecting transactions in securities for the account of others” or for their own account. Exchange Act Sections 3(a)(4), (5), 15 U.S.C. §§ 78c(a)(4), (5). On the regulation of broker-dealers, see, e.g., Peter H. Huang, *Trust, Guilt, and Securities Regulation*, 151 U. PA. L. REV. 1059, 1067–68 (2003).

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.¹⁰ Robinhood, for instance, used to shower digital confetti down a smartphone screen upon successful execution of a trade.¹¹ 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.¹²

The title of this paper uses the term “gamification,” which was a bit of an engagement practice itself.¹³ In financial advisory apps, we might call these gamification practices “behavioral design,” which fit within a broader category of regulatory concern: “digital engagement practices.”¹⁴ Gamification in the sense of behavioral

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 subjected to media and regulatory scrutiny.

¹⁰ See *infra* notes __ (describing this competition); Jennifer Schulp, *The Trading Game*, REGULATORY REVIEW (May 3, 2021) (CATO), <https://perma.cc/933Q-8YHL>; Nicole Casperson, *Robinhood Drops the Confetti, but Advisers Aren't Convinced*, INVESTMENT NEWS (Apr. 6, 2021), <https://www.investmentnews.com/robinhood-drops-the-confetti-but-advisers-arent-convinced-204828> (describing the competition as “duller than dishwasher”).

¹¹ See *infra* note 43.

¹² See *infra* Part I.A.

¹³ Thanks for reading.

¹⁴ 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.¹⁵ 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.¹⁶ 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.¹⁷

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.¹⁸ 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.¹⁹ 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.

¹⁵ See e.g., Kyle Langvardt & James Fallows Tierney, *On "Confetti Regulation": How Not to Regulate Gamified Investing*, 131 YALE L.J. FORUM (2021); *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III: Hearing Before the U.S. House Comm. on Fin. Servs.* __ (May 6, 2021) (Gensler statement).

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.²⁰ That underscores the urgent need for scholarship situating these practices in theory and doctrine.²¹ 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.²² This Article fills that gap, articulating from the ground up a theory of behavioral design in securities regulation.²³

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.

²¹ Nizan Geslevich Packin has addressed how securities regulation should deal with gamification as a particular problem of appealing to minor children's financial activities. See Nizan Geslevich Packin, *Financial Inclusion Gone Wrong: Securities Trading For Children* (2021). Several students have also addressed legal issues surrounding Robinhood in particular. See, e.g., John R. Fallon, Note, *Equal Access to Investments: At Whose Expense?*, 21 WAKE FOREST J. BUS. & INTELL. PROP. L. 431, 467 (2021).

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.²⁴ 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.²⁵

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.”²⁶ 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.

²⁴ See James Fallows Tierney, *Reconsidering Securities Industry Bars* (2021).

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.”²⁸ 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.”²⁹ Across literatures bearing on gamification in design, a common thread focuses on how the presentation of information bears on the decisions people make.³⁰ 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.³¹

These strategies are increasingly prevalent in business, education, and other fields.³² 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).

²⁹ Sebastian Deterding et al., *From Game Design Elements to Gamefulness: Defining “Gamification,”* MindTrek ’11: Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments (describing games in this sense as being “characterized by explicit rule systems and the competition or strife of actors in those systems toward discrete goals or outcomes”); *see also, e.g.*, Katie Seaborn & Deborah I. Fels, *Gamification in Theory and Action: A Survey*, 74 INT. J. HUMAN-COMP. STUD. 14, 14 (2015); KARL M. KAPP, *THE GAMIFICATION OF LEARNING AND INSTRUCTION: GAME-BASED METHODS AND STRATEGIES FOR TRAINING AND EDUCATION* 10 (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).

³² *See* Tae Wan Kim & Kevin Werbach, *More than Just a Game: Ethical Issues in Gamification*, 18 ETHICS INF TECHNOL 157, 157–58 (2016); *see also* *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III: Hearing Before the U.S. House Comm. on Fin. Servs.* __ (May 6, 2021) (statement of SEC Chairman Gary Gensler).

of users in service of some goal, including private profit.³³ 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.³⁴

Scholars have shown the role of user interface design in encouraging repeat engagement with stock trading apps.³⁵ 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.³⁶ 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.³⁷

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.³⁸ Some securities may be

³³ James "Pigeon" Fielder, *Robinhood Makes Wall Street Feel like a Game to Win – Not a Place Where You Can Lose Your Savings*, FAST COMPANY (Mar. 27, 2021), <https://perma.cc/452B-ALEY>.; Ned Welch, *A marketer's guide to behavioral economics*, MCKINSEY Q. (Feb. 1, 2010).

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.

³⁵ See Sayan Chaudhry & Chinmay Kulkarni, *Design Patterns of Trading Apps and Their Effects on Investing Behaviors*, Proceedings of Design in Interactive Systems 777 (Jun. 2021).

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

³⁷ See *infra* note 57.

³⁸ Dan Clarendon, *Robinhood Restricted its Popularity Data, You Can Still See Top Movers*, Market Realist (Jan. 21, 2021), <https://marketrealist.com/p/robinhood-top-movers/>. Robinhood in August 2020 "turned off a feature ... that allowed anyone to see which companies' shares were surging in popularity." Jeff John Roberts, *Robinhood will no longer share stock 'popularity data' with sites like Robintrack*, Fortune (Aug. 10, 2020), <https://fortune.com/2020/08/10/robinhood-popularity-data-robintrack-stock-market-trading-tracker/>. The public API for that feature had for some time provided a rich source

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

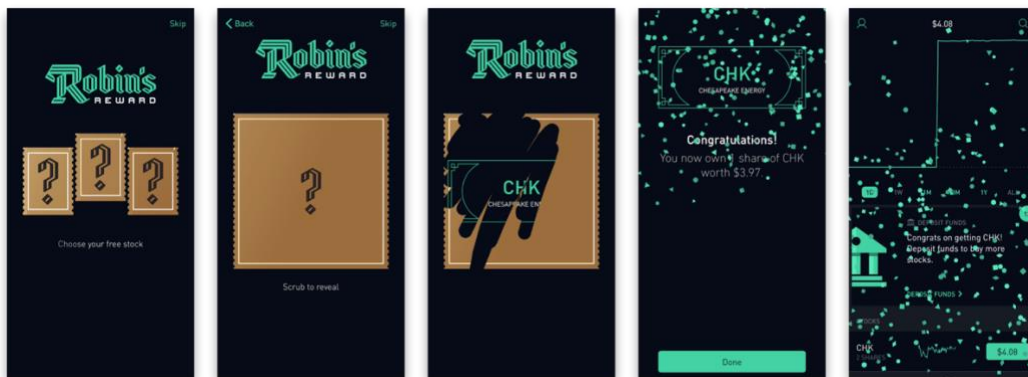


Figure 1: User flow during selection of variable reward, circa 2018⁴³

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

of retail trader data to financial economists, whose preliminary findings are discussed below.

³⁹ Langvardt & Tierney, *supra* note 15, at ___.

⁴⁰ Wursthorn & Choi, *supra* note 9. The confetti has since been deprecated; Robinhood announced in late March 2021 that it would “eliminat[e] digital confetti” to neutralize criticism ahead of its initial public offering. Caitlin McCabe, *Robinhood to Remove Controversial Digital Confetti from Trading*, WALL ST. J. (Mar. 31, 2021), <https://perma.cc/8B8J-6ETM>.

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 2018.⁴³ 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.”⁴⁴

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.⁴⁵ 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.⁴⁶

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.⁴⁷ 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.”⁴⁸ 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

⁴³ Tory Hobson, *Gamification in the Most Delightful Way*, MEDIUM: PINCH PULL PRESS (Jan. 25, 2018), <https://link.medium.com/uxXrSIPuCdb> (image source).

⁴⁴ *See Id.*

⁴⁵ George Vasiliadis, *How Robinhood Got Nearly 1 Million Users Before the Company Even Existed*, Viral Loops (Medium) (Nov. 23, 2017).

⁴⁶ Scott Galloway, *Robinhood Has Gamified Online Trading into an Addiction*, MARKET (Jul. 2020), <https://perma.cc/HMX2-MP77>; Matthew Q. Knipfer, *Optimally Climbing the Robinhood Cash Management Waitlist*, MEDIUM (Nov. 5, 2019), <https://perma.cc/G3TR-FZFF>.

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 micro-transactions. 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.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.⁵⁰ To that end, the Biden administration’s SEC Chairman, Gary Gensler, has made gamification a priority.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.”⁵² Since then, a majority of the Commission has expressed interest in regulating gamification.⁵³ The two Republican-appointed Commissioners, Hester Peirce and Elad Roisman, have taken a more cautious public approach toward regulating gamification.⁵⁴

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



⁴⁹ Matt Levine, *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, *supra* note 30.

⁵⁰ David Ingram, *Designed to Distract: Stock App Robinhood Nudges Users to Take Risks*, NBCNEWS.COM (Sep. 12, 2019), <https://perma.cc/JGH7-6KNU>.

⁵¹ See Benjamin Bain & Robert Schmidt, *Gensler Targets Broker “Gamification” After Trading Tumult*, BLOOMBERG (Mar. 2, 2021) (confirmation hearing).

⁵² Testimony of Gary Gensler, U.S. House Committee on Financial Services, *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III* (May 6, 2021), <https://www.youtube.com/watch?v=vX2X8xxHEns>; see Ben Bain, *Robinhood, Citadel Threatened by SEC Chief’s Push for New Rules*, BLOOMBERG (May 5, 2021).

⁵³ See Allison Herren Lee, Speech, *Leveraging Regulatory Cooperation to Protect America’s Investors: Remarks at the 2021 Seciton 19(d) Conference* (May 21, 2021) (May 2021).; Chris Ekimoff and Kurt Wolfe, *Enforcing the Regulations: A Conversation with Commissioner Crenshaw*, Insecurities Podcast (PLI) at 18:00-22:00 (June 17, 2021), <https://insecurities.podbean.com/e/enforcing-the-regulations---a-conversation-with-commissioner-crenshaw/>.

⁵⁴ See, e.g., Hester M. Peirce, 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, *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.⁵⁵ In August 2021, the SEC published a request for information (RFI) related to these issues.⁵⁶ 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.”⁵⁷ The agency has expressed interest in rulemaking that addresses digital engagement practices in the broker-dealer and registered investment adviser space.⁵⁸

Gamification has also attracted the attention of the Financial Industry Regulatory Authority (FINRA), the self-regulatory organization (SRO) for broker-dealers.⁵⁹ FINRA makes and enforces rules for brokers, and it implements these by examining and monitoring its member brokerage firms for compliance and regulatory risk.⁶⁰ FINRA notified members that it was scrutinizing compliance with rules on communications with clients in app-based investing platforms.⁶¹ FINRA noted the tradeoff between the

⁵⁵ Prepared testimony of Gary Gensler before the U.S. House Committee on Financial Services, *Game Stopped? Who Wins and Loses When Short Sellers, Social Media, and Retail Investors Collide, Part III 2* (May 6, 2021).

⁵⁶ Request for Information and Comments on Broker-Dealer and Investment Adviser Digital Engagement Practices, Exchange Act Release 92766, 86 Fed. Reg. 49067 (Sep. 1, 2021). I submitted a draft of this article as an attachment to a comment letter. See James Fallows Tierney, *Comment Letter on Digital Engagement Practices* (2021). According to the SEC’s website, hundreds of public comments have been filed with the agency. See *Submitted Comments on Release No. 34-92766*, SECURITIES AND EXCHANGE COMMISSION (Dec. 13, 2021, 2:00 pm), <https://www.sec.gov/comments/s7-10-21/s71021.htm>.

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 ____.

⁵⁹ FINRA is a registered national securities association under Exchange Act Section 15A, 15 U.S.C. § 78o-3. See, e.g., Benjamin P. Edwards, *The Dark Side of Self-Regulation*, 85 U. CIN. L. REV. 573, __ (2017).

⁶⁰ See, e.g., Kenneth B. Orenbach, *A New Twist to an On-Going Debate about Securities Self-Regulation: It’s Time to End FINRA’s Federal Income Tax Exemption*, 31 VA. TAX REV. 135, 150-53 (2011).

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.”⁶² FINRA has continued to discuss responses to gamification and the business model.⁶³

State securities regulators also play a role in enforcing broker-dealers’ obligations under the securities laws.⁶⁴ 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.⁶⁵

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.

⁶³ *See, e.g.,* Al Barbarino, *FINRA to Seek Public Input on “Gamification” of Stock Market*, LAW360 (May 19, 2021), <https://www.law360.com/securities/articles/1386379/finra-to-seek-public-input-on-gamification-of-stock-market>.

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).

⁶⁵ *See* Complaint, *Robinhood Financial, LLC*, Docket No. E-2020-0047 (Mass. Sec. Div. filed Dec. 16, 2020) (“Mass. Compl.”). The regulator sought to file an amended complaint seeking to revoke Robinhood’s registration as a broker-dealer in the state. *See* Motion for Leave to File Amended Administrative Complaint at 22–24, *Robinhood Financial, LLC*, Docket No. E-2020-0047 (Mass. Sec. Div. filed April 15, 2021) (“Mass. Amended Admin. Compl.”). In an amended complaint, the state alleged that Robinhood targeted unsophisticated investors, luring them in with app design features and “gamification strategies to manipulate [them] into continuous interaction and constant engagement with its application.” *Id.* at 6; *see, e.g.,* Mass. Gen. Laws ch. 110A, § 204(a)(2)(G); 950 Mass. Code Regs. 12.207(1)(a).

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

⁶⁶ See Brian G. Cartwright, SEC General Counsel, Speech by SEC Staff: The Future of Securities Regulation (Oct. 24, 2007) (coining the term); see also, e.g., Donald C. Langevoort, *The Sec, Retail Investors, and the Institutionalization of the Securities Markets*, 95 VA. L. REV. 1025, ___ (2009) (“the market for corporate securities ... is no longer substantially retail in nature”); see also, e.g., Gaia Balp, *The Corporate Governance Role of Retail Investors*, 31 LOY. CONSUMER L. REV. 47, 66–68 (2018); Jill E. Fisch, *Rethinking the Regulation of Securities Intermediaries*, 158 U. PA. L. REV. 1961, ___ (2010); Alicia Davis Evans, *A Requiem for the Retail Investor*, 95 VA. L. REV. 1105, ___ (2009); Steven M. Davidoff, *Paradigm Shift: Federal Securities Regulation in the New Millennium*, 2 BROOK. J. CORP. FIN. & COM. L. 339, 347–53 (2008).

⁶⁷ See, e.g., Sarah Haan, *Corporate Governance and the Feminization of Capital*, 74 STAN. L. REV. — (forthcoming 2022).

⁶⁸ Estimates vary based on the underlying data and the method. See, e.g., Marcel Kahan & Edward Rock, *Embattled CEOs*, 88 TEX. L. REV. 987, 996–97 (2008) (estimating about 68% in 1980 based on Federal Reserve flow of funds accounts data); Jack B. Jacobs, *“Patient Capital”:* *Can Delaware Corporate Law Help Revive It?*, 68 WASH. & LEE L. REV. 1645, 1650 (2011). (about 75%).

⁶⁹ Jacobs, *supra* note 68, at 1650.

⁷⁰ See, e.g., Paul G. Mahoney, *Is There a Cure for “Excessive” Trading?*, 81 VA. L. REV. 713, 733 n.65 (Apr. 1995); Evans, *supra* note 66, at 1117 n.44; cf. Brian G. Cartwright, *Whither the SEC Now*, 95 VA. L. REV. 1085, 1092 (2009).

⁷¹ Katie Martin & Robin Wigglesworth, *Rise of the Retail Army: The Amateur Traders Transforming Markets*, FINANCIAL TIMES (Mar. 8, 2021).

volume between 2011 and the first quarter of 2021.⁷² Retail investors' trading volume is also disproportionately high relative to ownership share of total market value.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

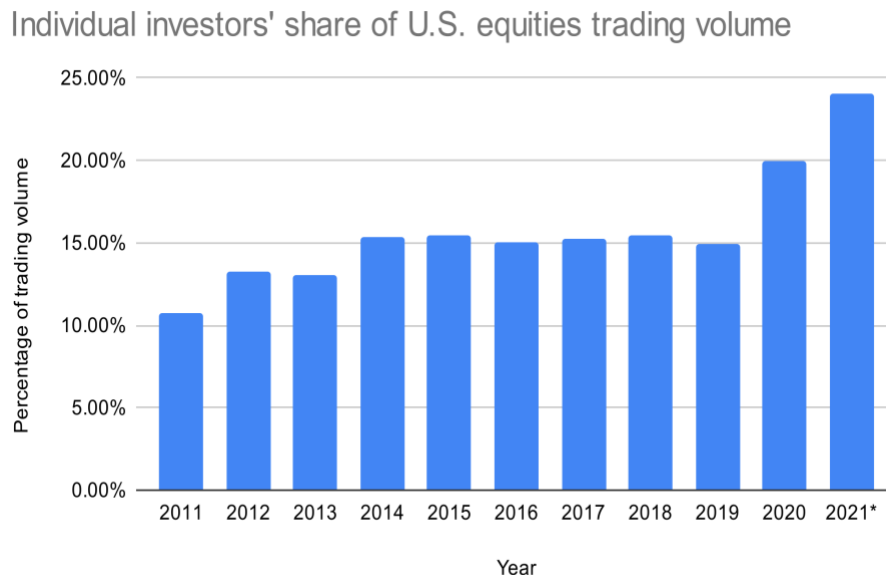


Figure 2: Data from Bloomberg Intelligence on retail investor trading volume

younger, had lower incomes, and were more racially diverse" than existing investors.⁷⁴ Of course, given wealth and income inequality, participating in equity markets remains out of reach for many people.⁷⁵ And the wealthiest households' share of ownership has only continued to grow over time.⁷⁶

⁷² Caitlin McCabe, *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.

⁷³ See, e.g., Richard Stanley, *Retail investors comprise 10 percent of U.S. daily trading*, PRECISE INVESTORS (July 1, 2021), <https://preciseinvestors.com/retail-investors-comprise-10-percent-of-u-s-daily-trading/>.

⁷⁴ Mark Lush et al., *Investing 2020: New Accounts and the People Who Opened Them* (Feb. 2021).

⁷⁵ See, e.g., Winston, *supra* note 17, at __; Lydia Saad & Jeffrey M. Jones, *What Percentage of Americans Owns Stock?*, Gallup (Aug. 13, 2021) ("Stock ownership is strongly correlated with household income, formal education, age and race."); cf. SIFMA Insights, Q: *Who Owns Stocks in America? A: Individual Investors, A Chart Book on Stock Ownership* (Oct. 2019), <https://www.sifma.org/wp-content/uploads/2019/10/SIFMA-Insights-Who-Owns-Stocks-in-America.pdf>.

⁷⁶ See, e.g., *Id.*; Thomas Piketty et al., *Distributional National Accounts: Methods and Estimates for*

Despite all that, record numbers of ordinary people have also been participating in the stock market.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.⁷⁸ In this view, trading is a substitute for other kinds of entertainment.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.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.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.⁸² This reduces barriers to entry, allowing

*the United States**, 133 THE QUARTERLY JOURNAL OF ECONOMICS 553, __ (May 2018).

⁷⁷ See, e.g., Madison Darbyshire, ‘*The Stimulus Has Landed’: US Retail Traders Set to Hit Stock Market*, FINANCIAL TIMES (Mar. 17, 2021), <https://www.ft.com/content/e67f5076-c517-4bd5-9688-c70cde011452>.

⁷⁸ See, e.g., Matt Phillips, *Recast as ‘Stimmies,’ Federal Relief Checks Drive a Stock Buying Spree*, N.Y. TIMES (Mar. 21, 2021), <https://perma.cc/ST8G-WCSJ>; Massa & Ponczek, *supra* note 9.

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>.

⁸⁰ David Forman, Chief Legal Officer, Fidelity Investments, *Comment Letter on Digital Engagement Practices* (2021).

⁸¹ On elasticity of demand for brokerage, see Lynn A. Stout, *Technology, Transaction Costs, and Investor Welfare: Is a Motley Fool Born Every Minute*, 75 WASH. U. L. Q. 791, 809–10 (1997).

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 than 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.

⁸³ 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).

⁸⁴ See Stanislav Dolgoplov, *Insider Trading and the Bid-Ask Spread: A Critical Evaluation of Adverse Selection in Market Making*, 33 CAP. U. L. REV. 83, 88–89 (2004). Of course, traders also bear other costs like SEC-imposed transaction fees. See, e.g., Yu-Chuan Huang, *Determinants of Trading Costs*, in MARKET MICROSTRUCTURE IN EMERGING AND DEVELOPED MARKETS (2013).

⁸⁵ See, e.g., VI LOUIS LOSS ET AL., SECURITIES REGULATION 277 (5th ed. ed. 2015).

⁸⁶ Charles M. Jones, *A Century of Stock Market Liquidity and Trading Costs* 7 (May 2002).

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.⁸⁸ Combined with technological innovation in the 1990s, price competition allowed investors to sort into the amount of hand-holding they wanted.⁸⁹

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 2013.⁹⁰ Legacy discount brokers like Charles Schwab, Fidelity, and TD Ameritrade slowly reduced commissions in response; all cut commissions to zero in 2019.⁹¹ Now many retail clients of discount brokers trade without paying meaningful commissions for public company stocks.⁹²

Commission pricing is particularly important to retail investors. This reflects salience models of decisionmaking in the market for brokerage services.⁹³ 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.⁹⁴ As people don't pay attention to nonsalient attributes, these do not bear on the decision to transact.⁹⁵

⁸⁸ See, e.g., Janice Traflet & Michael P. Coyne, *Ending a NYSE Tradition: The 1975 Unraveling of Broker's Fixed Commissions and its Long Term Impact on Financial Advertising*, 25 *ESSAYS IN ECON. & BUS. HIST.* 131 (2007); cf. John C. Coffee, *Market Failure and the Economic Case for a Mandatory Disclosure System*, 70 *VA. L. REV.* 717, 727 n.30 (1984).

⁸⁹ See, e.g., Caroline Bradley, *Disorderly Conduct: Day Traders and the Ideology of Fair and Orderly Markets*, 26 *J. CORP. L.* 63, 67 (2000).

⁹⁰ See Patrick McKenzie, *How Discount Brokerages Make Money*, *KALZUMEUS* (June 26, 2019), <https://perma.cc/RXS5-4ZQZ>.

⁹¹ See, e.g., Matt Levine, *Money Stuff: The Trades Will Be Free Now*, *BLOOMBERG OPINION* (Oct. 2, 2019).

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).

⁹⁴ See, e.g., Russell Korobkin, *Bounded Rationality, Standard Form Contracts, and Unconscionability*, 70 *U. CHI. L. REV.* 1203, 1206 (2003); Pedro Bordalo, Nicola Gennaioli & Andrei Shleifer, *Salience and Consumer Choice*, 121 *J. POL. ECON.* 803 (2013).

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.⁹⁶ A customer might pay directly, as with in-app micropayments in games like Candy Crush.⁹⁷ 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.”⁹⁸ 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).”⁹⁹ 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.¹⁰⁰ 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.¹⁰¹

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.¹⁰² 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”).

⁹⁷ See, e.g., Kyle Langvardt, *Regulating Habit-Forming Technology*, 88 *FORDHAM L. REV.* 129, 134–41 (2019).

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 MATTLI, *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.¹⁰³ This competitive landscape is the product of the same 1970s deregulatory reforms that promoted the creation of a national market system.¹⁰⁴ 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.¹⁰⁵ 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.¹⁰⁶

All this illustrates a key attribute of the national market system: nationwide continuous time best pricing on geographically dispersed execution venues.¹⁰⁷ 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

the extent they are routed to exchanges rather than other venues, orders are generally handled with electronic order books and matching engines.

¹⁰³ See *infra* note 112.

¹⁰⁴ See also *Market Data Infrastructure*, Exchange Act Release No. 90610, 2020 WL 7413527, at *577 (Dec. 9, 2020) (describing the “market for trading services in NMS stocks [as] currently consist[ing] of 16 national securities exchanges, as well as off-exchange trading venues including wholesalers and 34 NMS stock alternative trading systems”). For a criticism of the national market system, see Hester Peirce, *Rethinking the National Market System*, 43 J. CORP. L. 649 (2018).

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).

¹⁰⁶ See 17 C.F.R. § 242.600(50) (describing the “national best bid and national best offer”); see also, e.g., Onnig H. Dombalagian, *Best Execution: An Impossible Dream?*, in CAMBRIDGE HANDBOOK OF INVESTOR PROTECTION 7 (Arthur B. Laby ed., Cambridge University Press 2022).

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.¹⁰⁸ 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.¹⁰⁹

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.¹¹⁰ 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.¹¹¹ 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.”¹¹²

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

¹⁰⁸ See Tom C.W. Lin, *Reasonable Investor(s)*, 95 B.U. L. REV. 461, 489–91 (2015). On the emergence of high-frequency trading, see DONALD A. MACKENZIE, *TRADING AT THE SPEED OF LIGHT* (2021); MATTLI, *supra* note 101.

¹⁰⁹ Matteo Aquilina et al., *Quantifying the High-Frequency Trading “Arms Race”* (Jul. 2021)..

¹¹⁰ See MAUREEN O’HARA, *MARKET MICROSTRUCTURE THEORY* (1995).

¹¹¹ Staff of the Division of Trading and Markets, Securities and Exchange Commission, Memorandum to Equity Market Structure Advisory Committee, *Certain Issues Affecting Customers in the Current Equity Market Structure* 6 (Jan. 26, 2016), <https://www.sec.gov/spotlight/equity-market-structure/issues-affecting-customers-emsac-012616.pdf> (“TM Staff Mem.”).

¹¹² Dombalagian, *supra* note 106, at 7.

firms to take the other side of the trade.¹¹³ 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.¹¹⁴ 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.¹¹⁵ 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.¹¹⁶

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.”¹¹⁷ 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.

¹¹⁴ SEC, OCIE, *Special Study: Payment for Order Flow and Internalization in the Options Markets* (Dec. 2000), <https://www.sec.gov/news/studies/ordpay.htm>; see Exchange Act Rule 10b-10(d)(8), 17 CFR § 240.10b-10(d)(8); see also, e.g., Hitesh Mittal & Kathryn Berkow, *The Good, the Bad & the Ugly of Payment for Order Flow* (May 2021); Robinhood Financial, LLC, Securities Act Release No. 10906, 2020 WL 7482170, at *4 (Dec. 17, 2020).

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).

¹¹⁶ TM Staff Mem., *supra* note 111, at 7 (citing Final Rule, *Payment for Order Flow*, Exchange Act Release No. 34902, 59 Fed. Reg. 55006, 55009 (Nov. 2, 1994)); see also, e.g., Written Testimony of Gina-Gail Fletcher before the U.S. Senate Committee on Banking, Housing, and Urban Affairs, *Who Wins on Wall Street? GameStop, Robinhood, and the State of Retail Investing* 13 (Mar. 9, 2021), <https://www.banking.senate.gov/imo/media/doc/Fletcher%20Testimony%203-9-21.pdf>.

¹¹⁷ Paul G. Mahoney, *Equity Market Structure Regulation: Time to Start Over*, — MICH. BUS. & ENTREPRENEURIAL L. REV. forthcoming, 6 (2021)

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.¹¹⁸ 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.¹¹⁹ 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.¹²⁰ 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).

¹¹⁹ See Lynn A. Stout, *Why the Law Hates Speculators: Regulation and Private Ordering in the Market for OTC Derivatives*, 48 DUKE L.J. 701 (1999).?

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

¹²¹ See, e.g., Senator Pat Toomey, *Comment Letter on Digital Engagement Practices* (2021).;

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).

¹²³ See, e.g., Brad M Barber et al., *Just How Much Do Individual Investors Lose by Trading?*, 22 REV. FIN. STUD. 609 (2009); Barber & Odean, *supra* note 6.

¹²⁴ See, e.g., Daniel Dorn & Paul Sengmueller, *Trading as Entertainment?*, 55 MGMT. SCI. 591 (2009) (gambling, entertainment); Mark Grinblatt & Matti Keloharju, *Sensation Seeking, Overconfidence, and Trading Activity*, 64 J. FIN. 549 (Apr. 2009) (speeding).

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.

¹²⁶ Dorn & Sengmueller, *supra* note 124, at 593. Consistent with this prediction, evidence of retail trader behavior in Taiwan around introduction of a new source of legal gambling suggests that "some investors may view investing and gambling as substitutes." Michael Strahilevitz, *A Closer Look at the Causes and Consequences of Frequent Stock Trading*, in FINANCIAL BEHAVIOR: PLAYERS, SERVICES, PRODUCTS AND MARKETS 45, 212 (H. Kent Baker et al. eds., 2017); Łukasz Markiewicz & Elke U. Weber, *DOSPERT's Gambling Risk-Taking Propensity Scale Predicts Excessive Stock Trading*, 14 J. BEHAV. FIN. 65, __ (Routledge Jan. 2013).

¹²⁷ John P. Anderson et al., *Social Media, Securities Markets, and the Phenomenon of Expressive Trading*, 25 LEWIS & CLARK L. REV. (2021),

market may also be what most make it like a “game” to some observers.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.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.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.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.¹³² This is

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3834801.

¹²⁸ Aegis J. Frumento, *[In]Securities Guest Blog: Mind Games*, BROKE AND BROKER (May 7, 2021), <http://www.brokeandbroker.com/5835/insecurities-aegis-frumento-gamification>.

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/odean/papers/Day%20Traders/Day%20Trading%20and%20Learning%20110217.pdf>.

¹³⁰ *Robinhood’s Vlad Tenev talks mission*, THIS WEEK IN STARTUPS, episode 736 (2017).

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).

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).¹³³ 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.¹³⁴

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.¹³⁵ 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.¹³⁶ Whatever the origin of these traders' propensity to trade based on noise,¹³⁷ "[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."¹³⁸

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

FICTIONAL EXPECTATIONS AND CAPITALIST DYNAMICS __ (Harvard UP 2016).

¹³³ See, e.g., Zohar Goshen & Gideon Parchomovsky, *The Essential Role of Securities Regulation*, 55 DUKE L.J. 711, 714–15 (Feb. 2006).

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").

¹³⁵ See, e.g., Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 THE AMERICAN ECONOMIC REVIEW 393, __ (American Economic Association 1980).

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 __.

¹³⁸ Alessio M. Paces, *Financial Intermediation in the Securities Markets Law and Economics of Conduct of Business Regulation*, 20 INTERNATIONAL REVIEW OF LAW AND ECONOMICS 479, 494 (Dec. 2000).

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.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."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.¹⁴¹ They find that Robinhood clients

¹³⁹ John Beshears et al., *Behavioral Household Finance*, in 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." *Id.* at 47.

¹⁴⁰ Gregory W. Eaton et al., *Zero-Commission Individual Investors, High Frequency Traders, and Stock Market Quality* __ (Apr. 2021).

¹⁴¹ Brad M. Barber et al., *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.¹⁴² 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.¹⁴³ 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.¹⁴⁴

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).

¹⁴³ Taha Havakhor et al., *Tech-Enabled Financial Data Access, Retail Investors, and Gambling-like Behavior in the Stock Market: Evidence from a Natural Experiment* (2021).

¹⁴⁴ Juho Hamari et al., *Gamification and Economics*, in *THE GAMEFUL WORLD: APPROACHES, ISSUES, APPLICATIONS* 139, 140 (Steffen P. Walz & Sebastian Deterding eds., MIT Press 2015).

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 __.

¹⁴⁷ See Rachel Geoffroy & Heemin Lee, *The Role of Academic Research in SEC Rulemaking: Evidence from Business Roundtable v. SEC*, 59 J. ACCT. RES. 375 (2021).

¹⁴⁸ See, e.g., Deborah DeMott, *Rogue Brokers and the Limits of Agency Law*, in CAMBRIDGE HANDBOOK OF INVESTOR PROTECTION __ (Arthur B. Laby ed., 2022).

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.¹⁵⁰

This kind of agency cost problem is intimately familiar to scholars of capital markets.¹⁵¹ 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.¹⁵² In fact, concerns about the conflict of interest in brokerage have been a mainstay of broker-dealer regulation for nearly a century.¹⁵³

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.”¹⁵⁴

But the basic problem of shaping consumer behavior for private profit is not new, even in the world of retail investment markets.¹⁵⁵ 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

Nov. 4, 2020).

¹⁵⁰ See, e.g., Benjamin P. Edwards, *Conflicts & Capital Allocation*, 78 OHIO ST. L.J. 181, 184 (2017).

¹⁵¹ See Paccès, *supra* note 138, at 481, 483; see generally J.J. LAFFONT & D. MARTIMORT, *THE THEORY OF INCENTIVES: THE PRINCIPAL-AGENT MODEL* (Princeton University Press 2009). For other examples from the literature using an agency cost model for the brokerage industry, see James Fallows Tierney & Benjamin P. Edwards, *Secretly Recidivist Brokers: Error Costs in FINRA Expungement* __ (2022); DeMott, *supra* note 148, at __; Benjamin P. Edwards, *The Professional Prospectus: A Call for Effective Professional Disclosure*, 74 Wash. & Lee L. Rev. 1457, 1469 (2017); Iris Chiu, *Securities Intermediaries in the Internet Age and the Traditional Principal-Agent Model of Regulation: Some Observations from the EU’s Markets in the Financial Instruments Directive*, 2 J. INT’L COMM. L. & TECH. 38, __ (2007); Mahoney, *supra* note 70, at __.

¹⁵² Memorandum from SEC Div. of Risk, Strategy & Fin. Innovation & Office of Gen. Counsel to Staff of the SEC Rulewriting Divs. & Offs. (Mar. 16, 2012).

¹⁵³ See, e.g., Allen Ferrell & John D. Morley, *The Regulation of Intermediaries*, in SECURITIES MARKET ISSUES FOR THE 21ST CENTURY 311, 370 (Merritt B. Fox et al. eds., 2018); Securities and Exch. Comm’n, *Report of Special Study of Securities Markets*, No. H. Doc. No. 95, 88th Cong., 1st Sess. Ch. 3, 254 (1964).

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.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.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.¹⁵⁸ Some of these design features are the natural evolution of sales techniques that have long existed in physical space.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.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?¹⁶¹

¹⁵⁶ 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. See BOILER ROOM (2000).

¹⁵⁷ Cf. Gullotti, *supra* note 47 (suggesting that DEPs make apps like boiler rooms).

¹⁵⁸ See Langvardt & Tierney, *supra* note 15, at ___ (arguing that securities law should avoid intervening at the level of game design).

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

¹⁶⁰ Thanks to Alex Platt for the basic contours of the hypothetical.

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. 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.¹⁶² John Coffee has pointed out that what matters is the refinement of the interaction over time to encourage trading.¹⁶³

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").

¹⁶³ *See* John C. Coffee, *Gamification: Why Do We Care About Robinhood? What Could the SEC Realistically Do?*, N.Y.L.J. (Nov. 17, 2021)

action.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.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."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."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."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

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").

¹⁶⁵ See J.W. Verret, *Robinhood's Threat to Sue the SEC Over Broker-Inducement Regulation Unlikely to Succeed* 9 (Nov. 2021).

¹⁶⁶ Langevoort, *supra* note 66, at 1081.

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

¹⁶⁸ See, e.g., the Libertarian Party.

markets.”¹⁶⁹ 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.”¹⁷¹

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

¹⁶⁹ Jeffrey J. Rachlinski, *The Uncertain Psychological Case for Paternalism*, 97 NW. U. L. REV. 1165, 1185 (2002).

¹⁷⁰ Elaine A. Welle, *Freedom of Contract and the Securities Laws: Opting Out of Securities Regulation by Private Agreement*, 56 WASH. & LEE L. REV. 519, 581 (1999)

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.”¹⁷³ Securities markets are not lotteries, of course, and there are disparate regulatory regimes covering gambling and gaming in jurisdictions where they are legal.¹⁷⁴ But suppose we were to say that people could not trade stocks, only institutions could.¹⁷⁵ 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.¹⁷⁶

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.¹⁷⁷ 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).¹⁷⁸ The default rules thus instruct that prudent people shouldn’t be day trading, even less so in Dogecoin.¹⁷⁹

¹⁷³ See, e.g., STUART BANNER, *SPECULATION: A HISTORY OF THE FINE LINE BETWEEN GAMBLING AND INVESTING* (2017); Stout, *supra* note 119, at __; STUART BANNER, *ANGLO-AMERICAN SECURITIES REGULATION: CULTURAL AND POLITICAL ROOTS, 1690-1860* __ (Cambridge University Press 1998).

¹⁷⁴ See, e.g., Thomas Lee Hazen, *Disparate Regulatory Schemes for Parallel Activities: Securities Regulation, Derivatives Regulation, Gambling, and Insurance*, 24 ANN. REV. BANKING & FIN. L. 375, __ (2004); Anthony N. Cabot & Louis V. Csoka, *The Games People Play: Is It Time for a New Legal Approach to Prize Games?*, 4 NEV. L. REV. 197, 240 (2004); cf. John Luttig, *Finance as Culture*, SUBSTACK: LUTTIG’S LEARNINGS (Feb. 28, 2021), <https://luttig.substack.com/p/finance-as-culture>.

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 __.

¹⁷⁷ See Uniform Prudent Investor Act § 3 cmt. (1994).

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.¹⁸⁰ The accredited investor standard has historically limited investment in private securities to institutions and wealthy individuals.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.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.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).¹⁸⁴ As "[n]oise trading cannot be prohibited as such," the question is how much to tolerate, and by whom.¹⁸⁵

This field of law is structured in many ways that reduce opportunities for short-term speculation on price momentum in asset markets.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

¹⁸⁰ As a result, securities law is not concerned with paternalism as such. *See, e.g.,* Bullard, *supra* note 171, at 351; Welle, *supra* note 170, at ___.

¹⁸¹ *See infra* note 245.

¹⁸² *See infra* notes 227-229.

¹⁸³ *See* Winston, *supra* note 17.

¹⁸⁴ *See* ROBERT J. SCHILLER, 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.

¹⁸⁵ Paccos, *supra* note 138, at ___.

¹⁸⁶ *See* Stout, *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.”¹⁸⁷

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 deplete 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.”¹⁸⁸ 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.¹⁸⁹

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.”¹⁹⁰ 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.¹⁹¹

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.¹⁹² 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.¹⁹³

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.

¹⁹⁰ See Matt Levine, *Money Stuff: Melvin Capital Had a Better Month*, Bloomberg Opinion (Mar. 4, 2021), <https://www.bloomberg.com/opinion/articles/2021-03-04/melvin-capital-improves-from-gamestop-reddit-struggle>; cf. Brian Knutson and Peter Bossaerts, *Neural Antecedents of Financial Decisions*, 27 J. NEUROSCI. 8174 (2007).

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.¹⁹⁴ 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.¹⁹⁵ 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.”¹⁹⁶

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.¹⁹⁷ 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

¹⁹⁴ 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).

¹⁹⁵ See, e.g., Brad M. Barber & Terrence Odean, *All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors*, 21 REV. FIN. STUD. 785 (2008).

¹⁹⁶ Barber & Odean, *supra* note 6, at 776.

¹⁹⁷ 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

¹⁹⁸ See, e.g., Steven McNamara, *The Law and Ethics of High-Frequency Trading*, 17 MINN. J. L. SCI. & TECH. 71, 74 (2016). (explaining that “a number of characteristics of [high frequency trading] suggest they constitute, to some degree at least, a rent extracted from long-term investors”); Daniel Avis, *Warren Says ‘Sharks’ Citadel, Robinhood Prey on Consumers*, BLOOMBERG (Mar. 9, 2021), <https://www.bloomberg.com/news/articles/2021-03-09/warren-says-sharks-citadel-robinhood-profit-off-of-customers> (quoting Senator Elizabeth Warren at a Senate Banking Committee meeting: PFOF can be thought of as “skim[ming] off the top at the expense of small investors”). See also, e.g., Robert H. Battalio & Tim Loughran, *Does Payment for Order Flow To Your Broker Help or Hurt You?*, 80 J. BUS. ETHICS 37 (2007); see also, e.g., Mittal & Berkow, *supra* note 114, at 18 (describing “price improvement on retail market orders [as] akin to getting a 30% discount on an item after the shopkeeper raises the price by 40%”); Better Markets, *Fact Sheet – Reddit, Robinhood, GameStop & Rigged Markets: The Key Issues for Investigation* (Feb. 1, 2021), https://bettermarkets.com/sites/default/files/documents/Better_Markets_Reddit_Robinhood_Gamestop_RiggedMarkets_02-01-2021.pdf.

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.²⁰⁰ 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.”²⁰¹ 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.²⁰² 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.²⁰³

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.”²⁰⁴ 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.²⁰⁵ 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.²⁰⁶ “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.”²⁰⁷

The piling-on trades that aggressive gamification promotes can also distort allocation in capital markets.²⁰⁸ 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

²⁰³ 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.

²⁰⁴ Evans, *supra* note 66, at 1119–20

²⁰⁵ 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).

²⁰⁶ 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.

²⁰⁷ *Id.* at 5-6.

²⁰⁸ 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”).

function.²⁰⁹

§

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.”²¹⁰ 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.²¹¹

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

²¹² See *supra* note 152. This subpart has identified several undesirable social welfare effects of broker-dealer regulation. The first two are forms of residual costs associated with principal-agent problems, and the third is an externality.

²¹³ See Langvardt, *supra* note 97, at ___. In the same vein, the “asymmetric paternalism” framework identifies an overlapping set of “existing and potential regulatory responses to errors in decision making”: “(1) default rules; (2) provision or reframing of information; (3) cooling-off periods; and (4) limiting consumer choices.” Colin Camerer et al., *Regulation for Conservatives: Behavioral Economics and the Case for “Asymmetric Paternalism,”* 151 U. PA. L. REV. 1211, 1224-50 (2003).

²¹⁴ See, e.g., Langevoort, *supra* note 66, at 1043.

²¹⁵ See Langvardt, *supra* note 97, at 154.

²¹⁶ Form CRS Relationship Summary, Exchange Act Release No. 86032, 84 Fed. Reg. 33492, 33533 (July 12, 2019).

²¹⁷ See Exchange Act Rule 10b-10(a), 17 C.F.R. § 240.10b-10(a). The SEC has settled an enforcement action with Robinhood over allegations that it misleadingly omitted from

they route to other venues for execution.²¹⁸

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.²¹⁹ 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.²²⁰ But there are reasons to worry that retail investors will not adequately consume these disclosures.²²¹ 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.²²² But as existing disclosure rules have not moved the needle, regulators should not rest on disclosure solutions alone.²²³

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.²²⁴ 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.²²⁵

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.

²¹⁸ See, e.g., Regulation NMS Rule 606, 17 C.F.R. § 242.606; Final Rule, *Disclosure of Order Handling Information*, Exchange Act Release No. 84528, 83 Fed. Reg. 58,338 (Nov. 19, 2018); see also Note, *The Perils of Payment for Order Flow*, 107 HARV. L. REV. 1675, 1690-92 (1994).

²¹⁹ See, e.g., *Temporary Rule Regarding Principal Trades with Certain Advisory Clients*, Advisers Act Release No. 2653.

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>.

²²¹ See, e.g., Robert A. Prentice, *Moral Equilibrium: Stock Brokers and the Limits of Disclosure*, 2011 WISC. L. REV. 1059.

²²² See *supra* note 95.

²²³ Dombalagian, *supra* note 106, at 10.

²²⁴ See Langvardt, *supra* note 97, at 154.

²²⁵ See, e.g., Cary Frydman & Baolian Wang, *The Impact of Salience on Investor Behavior: Evidence from a Natural Experiment*, 75 J. FIN. 229, __ (Feb. 2020); Thomas F. Crossley et al., *Can Survey Participation Alter Household Saving Behaviour?*, 127 THE ECONOMIC JOURNAL 2332, __ (Nov. 2017).

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 – within a 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).

²²⁷ Jill E. Fisch, *Regulatory Responses to Investor Irrationality: The Case of the Research Analyst*, 10 LEWIS & CLARK L. REV. 57, 75 (2006).

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).

²³⁰ See, e.g., *De Kwiatkowski v. Bear, Stearns & Co.*, 306 F.3d 1293, 1302 (2d Cir. 2002).

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.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.²³³ Empirical studies of intraday speculative trading in Chinese capital markets indicate that this may reduce trading volume and price transparency.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

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. *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).

²³³ See, e.g., Rules of the Shanghai Stock Exchange §§ 3.1.4, 3.1.5 (2018 revision). See generally Ming Guo et al., *A Unique "T+1 Trading Rule" in China: Theory and Evidence*, 36 J. BANKING & FIN. 575, __ (Feb. 2012); China Sec. Reg. Comm'n, CHINA CAPITAL MARKETS DEVELOPMENT REPORT 2008, 243 (Nov. 2009). On securities regulation in China generally, see JING BIAN, CHINA'S SECURITIES MARKET: TOWARDS EFFICIENT REGULATION (2014).

²³⁴ See, e.g., See Zhengyang Bao et al., *Do Regulations Work? A Comprehensive Analysis of Price Limits and Trading Restrictions in Experimental Asset Markets with Deterministic and Stochastic Fundamental Values*, 178 JOURNAL OF ECONOMIC BEHAVIOR & ORGANIZATION 59, __ (Oct. 2020); Xinyun Chen et al., *Does the T+1 Rule Really Reduce Speculation? Evidence from the Chinese Stock Index ETF*, 57 ACCOUNTING & FIN. 1287 (Dec. 2017).

on top of the pricing, then regulators might seek to address that root problem.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.”²³⁶

Transactional frictions are familiar if underused tools in securities regulation.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.²³⁸ Surveying the debate about excessive trading in 1995, Paul Mahoney noted that transfer taxes could implement transactional frictions against noise traders’ excessive speculation.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.²⁴⁰ But these efforts have also been unsuccessful. The political economy faces headwinds, too: it would be “politically terrible” to require

²³⁵ There is mixed empirical evidence on the causal mechanism underlying this kind of proposal. Compare, e.g., Eaton et al., *supra* note 140, at __, with Charles M. Jones & Paul J. Seguin, *Transaction Costs and Price Volatility: Evidence from Commission Deregulation*, 87 AM. ECON. REV. 728 (1997).

²³⁶ Langvardt, *supra* note 97, at __ (discussing counter-addictive design).

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., *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, *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 “reconfigur[ation of] at least a small part the technological system of U.S. share trading”).

²³⁸ See, e.g., Lawrence H. Summers & Victoria P. Summers, *When Financial Markets Work Too Well: A Cautious Case for a Securities Transaction Tax*, 3 J. FIN. SERVICES RES. 261 (1989); but see Joseph A. Grundfest & John B. Shoven, *Adverse Implications of a Securities Transactions Excise Tax*, 6 J. ACCT. AUDITING & FIN. 409 (1991).

²³⁹ Mahoney, *supra* note 70, at 714.

²⁴⁰ See, e.g., Joe Light, *Wall Street Transaction Tax Wins Backers on GameStop Furor*, BLOOMBERG TAX (Feb. 19, 2021).

brokers to move from “free” to nonzero commissions.²⁴¹ 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.²⁴² 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?²⁴³ 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.²⁴⁴ 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

²⁴¹ See Matt Levine, *Money Stuff: People Are Worried About Payment for Order Flow*, BLOOMBERG OPINION (Feb. 5, 2021).

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).

²⁴⁴ See, e.g., Amy Kapczynski, *The Lochnerized First Amendment and the FDA: Toward a More Democratic Political Economy*, 118 COLUM. L. REV. ONLINE 179 (2018).

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.

²⁴⁶ See, e.g., Nancy C. Libin & James S. Wrona, *The Securities Industry and the Internet: A Suitable Match?*, 2001 COLUM. BUS. L. REV. 601.

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

over the affairs of another, which give rise to a greater degree and broader set of duties than ordinarily exist.

²⁴⁸ See, e.g., *Patsos v. First Albany Corp.*, 433 Mass. 323, 336 (2001).

²⁴⁹ See Dodd-Frank Wall Street Reform and Consumer Protection Act § 913.

²⁵⁰ See, e.g., James A. Fanto, *Techniques of Regulatory Implementation: The Case of Reg BI and Form CRS*, in *CAMBRIDGE HANDBOOK OF INVESTOR PROTECTION* __ (Arthur B. Laby ed., Cambridge University Press 2022).

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).

²⁵² See, e.g., Morgan Lewis, *2020 Year in Review and a Look Forward: Select SEC and FINRA Developments and Enforcement Cases 11* (2021); cf. Mark Schoeff, *SEC Can Handle Digital 'Nudges' with Regulation Best Interest: SIFMA*, *INVESTMENT NEWS* (Dec. 7, 2021), <https://www.investmentnews.com/sec-can-handle-digital-nudges-with-regulation-best-interest-sifma-214906> (noting that the brokerage industry trade association is discouraging the SEC from extending Reg BI in any respects because it gives the agency "all the tools and authority that it needs").

²⁵³ Cf., e.g., James Fallows Tierney, *Summary Dismissals*, 77 U. CHI. L. REV. 1841, 1860–61 (2010)

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.²⁵⁴ And in December 2020, it brought an administrative enforcement proceeding against Robinhood, alleging that it violated the new fiduciary standard by engaging in gamification.²⁵⁵ 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.²⁵⁶ 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.²⁵⁷

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

(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).

²⁵⁴ See Adopting Release, Amendments to Standard of Conduct Applicable to Broker-Dealers and Agents (Mass. Sec. Div. Feb. 21, 2020).

²⁵⁵ See *supra* notes 64.

²⁵⁶ See *Compl., Robinhood Fin., LLC v. Galvin*, No. 2184 cv 0084 BLS (Mass. Super. Ct. filed Apr. 15, 2021) (“Robinhood Compl.”). Robinhood also argued that regulation of gamification through a ban on dangerous features would burden commercial speech in violation of its First Amendment rights.

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.²⁵⁸ 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.²⁵⁹ 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."²⁶⁰

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.²⁶¹ A broker that makes recommendations to

²⁵⁸ Other than baseball cards.

²⁵⁹ See, e.g., FINRA Rule 2111.

²⁶⁰ Regulation Best Interest, Exchange Act Rule 15l-1(a)(2)(ii)(C), 17 C.F.R. § 240.15l-1(a)(2)(ii)(C).

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

²⁶⁸ See Ana Carolina Tomé Klock et al., *Tailored Gamification: A Review of Literature*, 144 INTERNATIONAL JOURNAL OF HUMAN-COMPUTER STUDIES 102495 (Dec. 2020).

²⁶⁹ See NASD Notice to Members 01-23, *Suitability Rule and Online Communications*, <https://www.finra.org/rules-guidance/notices/01-23>. A search engine for securities, NASD said, would *not* qualify as a recommendation—but only where “the algorithms for these tools are not programmed to produce lists of securities ... that favor those securities in which the member makes a market.” *Id.* The SEC approved this SRO rule change, giving it force of law in enforcement proceedings. See, e.g., 15 U.S.C. § 78s(b); Exchange Act Rule 19b-4(a)(6), 17 C.F.R. § 240.19b-4(a)(6); *ABN AMRO Clearing Chicago LLC*, Exchange Act Release No. 83849, 2018 WL 3869452, at *2 (Aug. 15, 2018). On enforcement of SRO “rules,” see Benjamin Edwards & James Fallows Tierney, Comment Letter on Financial Crimes Enforcement Network Advance Notice of Proposed Rulemaking on Anti-Money Laundering Effectiveness (Nov. 16, 2020), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3731801.

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.

²⁷¹ 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.

²⁷³ On principles-based regulation, see Christie Ford, *New Governance, Compliance, and Principles-Based Securities Regulation*, 45 AM. BUS. L.J. 1 (2008).

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.*

²⁷⁷ See, e.g., Al Barbarino, *FINRA Report Puts ‘Game-Like’ Trading Apps on Notice*, Law360 (Feb. 2, 2021); FINRA, 2021 Report on FINRA’s Examination and Risk Monitoring Program 2 (Feb. 2021).

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

²⁷⁸ See, e.g., Benjamin Bain and Robert Schmidt, *Gensler Swims Against Tide in Payment-for-Order-Flow Fight*, BLOOMBERG (Aug. 31, 2021).

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 “salien[ce 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”).

²⁸² Annie Massa & Tracy Alloway, *Robinhood’s Role in the Gamification of Investing*, BLOOMBERG, <https://www.bloomberg.com/news/articles/2020-12-19/robinhood-s-role-in-the-gamification-of-investing-quicktake>.

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."²⁸³ 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.²⁸⁴

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.²⁸⁵ By all accounts, millennial 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.²⁸⁶ To that end, many of gamification's proponents in industry and scholarship have celebrated its role in engaging millennials.²⁸⁷ 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.²⁸⁸

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."

²⁸⁶ See, e.g., Victoria J. Haneman, *Intergenerational Equity, Student Loan Debt, and Taxing Rich Dead People*, 39 VA. TAX. REV. 197, 199 (2019).

²⁸⁷ See, e.g., van der Heide & Želinský, *supra* note 281, at 6 (analyzing gamification narratives about "digital natives" and "multigenerational wealth transfer" to "millennials").

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.”²⁸⁹ 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 ___.

²⁹⁴ Cf., e.g., Jedediah Britton-Purdy et al., *Building a Law-and-Political-Economy Framework: Beyond the Twentieth-Century Synthesis*, 129 YALE L.J. 1784 (2020)

modern economy.²⁹⁵ 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.”²⁹⁶

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.”²⁹⁷ As with the band of outsiders led by highwayman Robin of Locksley, this suggests reallocation of surplus from rich to poor.²⁹⁸ While clever, this hides that the enterprise is about enticing unsuspecting travelers for a “free” visit so the highwayman’s real customers²⁹⁹ can take a nonsalient toll for the privilege.³⁰⁰ It would be one thing if democratized finance concept meant everyone had equitable access to ownership of equity

²⁹⁵ See, e.g., Greta R. Krippner, *The Financialization of the American Economy*, 3 SOCIO-ECONOMIC REVIEW 173, __ (May 2005) (defining financialization as “a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production”); cf. Till van Treeck, *The Political Economy Debate on “Financialization” – a Macroeconomic Perspective*, 16 REV. INT’L POL. ECON. 907, 924–25 (2009).

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.” PJ 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.³⁰¹ 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.³⁰² 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.³⁰³

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.³⁰⁴

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."³⁰⁵ 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.³⁰⁶ 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

³⁰¹ See, e.g., JOHN E. ROEMER, *EQUAL SHARES: MAKING MARKET SOCIALISM WORK* __ (Erik Olin Wright ed., 1994).

³⁰² See, e.g., Eric Levitz, *Robinhood Banning GameStop Proves the Free Market is a Lie*, N.Y. MAG. INTELLIGENCER (Jan. 28, 2021), <https://nymag.com/intelligencer/2021/01/robinhood-ban-gamestop-share-price-explained.html>.

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).³⁰⁷ 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.³⁰⁸ 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.”³⁰⁹ Other proponents have noted this optimistic role for thoughtful design.³¹⁰

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.³¹¹ 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-optimistic claims are attractive because they promise to promote learning and to encourage better substantive financial outcomes, all with modest regulatory touch. Securities law

³⁰⁷ See, e.g., Margaret Miller et al., *Can You Help Someone Become Financially Capable? A Meta-Analysis of the Literature*, 30 THE WORLD BANK RESEARCH OBSERVER 220, __ (Aug. 2015); Daniel Fernandes et al., *Financial Literacy, Financial Education, and Downstream Financial Behaviors*, 60 MANAGEMENT SCIENCE 1861, __ (INFORMS Jan. 2014).

³⁰⁸ 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).

³⁰⁹ Al Barbarino, *SEC’s Peirce on Crypto Ambitions, GameStop’s Lessons*, LAW360 (May 3, 2021), <https://www.law360.com/securities/articles/1379758/sec-s-peirce-on-crypto-ambitions-gamestop-s-lessons>.

³¹⁰ See, e.g., Fielder, *supra* note 33.; Mike Lee, *How gamification could take investor experiences to a new level*, ERNST & YOUNG (Apr. 26, 2019).

³¹¹ 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.³¹² Some studies have found evidence that gamification techniques can promote financial education.³¹³ 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.³¹⁴

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).

³¹³ See, e.g., Luís Filipe Rodrigues et al., *Playing Seriously – How Gamification and Social Cues Influence Bank Customers to Use Gamified e-Business Applications*, 63 COMP. IN HUM. BEHAV. 392 (2016).

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.”³¹⁵

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.³¹⁶ 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.³¹⁷

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

³¹⁸ See Eric C. Chaffee, *Securities Regulation in Virtual Spaces*, 74 WASH. & LEE L. REV. 1387, 1454–56 (2017); cf. Juan Pablo Pardo-Guerra, *Where Are the Market Devices? Exploring the Links among Regulation, Markets, and Technology at the Securities and Exchange Commission, 1935–2010*, 49 THEORY AND SOCIETY 245, 246 (Mar. 2020) (studying “the relative neglect of technology as an object of [securities] regulation”).

³¹⁹ Frank Pasquale, *Law’s Acceleration of Finance: Redefining the Problem of High-Frequency Trading*, 36 CARDOZO L. REV. 2085, 2086 (Aug. 2015).

³²⁰ Alex Preda, *Socio-Technical Agency in Financial Markets: The Case of the Stock Ticker*, 36 SOC STUD SCI 753, 760–61 (SAGE Publications Ltd Oct. 2006); see also Devin Kennedy, *The Machine in the Market: Computers and the Infrastructure of Price at the New York Stock Exchange, 1965–1975*, 47 SOC STUD SCI 888, __ (SAGE Publications Ltd Nov. 2017).

³²¹ ALEX PEDA, 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.