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FALSE IDOLS: THE PERILS OF ‘DEMOCRATIZING’ FINANCIAL MARKETS

A THESIS APPROVED FOR THE

DEPARTMENT OF PHILOSOPHY

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Abstract

US stock markets have created the greatest wealth in human history. This wealth, however, has not been shared or distributed equally. I seek to understand the way in which income disparities work to undermine mechanisms within the market itself. This Thesis addresses a proposed means for making wealth creation more equitable - so-called 'democratization' of the stock markets. I argue that one iteration of the approach, exemplified by the retail trading firm Robinhood, does *not* fulfill this equity ideal. Robinhood makes it cheaper and easier for 'regular folks' to get into finance. By way of both its business model and app design and user interface, it has detrimental effects on equity in financial markets. Financial markets *can* be a force for good, but only as long as they operate to meet their own appropriate goals of efficiently and productively allocating capital resources. Robinhood-style trading, however, creates an environment more similar to a casino than an auction, potentially harming Robinhood traders and distracting finance professionals with the lure of easy new money. Wealth generation in this context comes apart from the allocative purpose of the market. This concern can be mitigated with intelligently designed adjustments to the system that align profitability with ethicality. Such behavioral and structural changes can originate from market participants, technology providers who create the platforms used by participants, or market regulators.

Introduction

Critics of contemporary financial markets come at them from a variety of directions. Socialists dislike private capital ownership itself. Industry insiders argue that innovation is being stifled by overregulation. Many political centrists regard such financial players as wholly untrustworthy. Popular movements, from Occupy Wallstreet to Reddit traders on r/WallStreetBets, criticize what they see as a corrupt and inequitable system that allocates a disproportionate amount of wealth to a small minority of the population. Certain academics have highlighted psychological aspects of decision making that exacerbate tendencies toward unethical economic choices.[1] Other academic criticisms focus on inefficiencies that exist in the effective allocation of capital to incentivize innovation and market competition.[2] These criticisms can all be valid starting places for examining financial markets.

This paper approaches stock market issues from the perspective of income and wealth inequality. US stock markets have created the greatest wealth in human history. This wealth, however, has not been shared or distributed equally. As scholarship and popular discourse on inequality has grown, so too have criticisms of the financial system. I seek to understand the way in which income disparities work to undermine mechanisms within the market itself. My approach *doesn't* question the virtues of the stock market as a means of allocating resources. In this paper I will grant that the financial system is a useful mechanism for distributing capital, albeit not one that is as self-regulating as its advocates are prone to think.[3] From this perspective I will address a proposed means for making wealth creation more equitable - so-called 'democratization' of the stock markets.[4] In particular, I argue that one iteration of the approach,

[1] Tenbrunsel and Messick, "Ethical Fading," 223-236.
[2] Roth, *Who Gets What and Why*, chap 2.
[3] Satz, *Why Some Things Should Not Be for Sale*, chap 1.
[4] 'Democratization' is a term employed to encourage broader participation in the market by 'retail' traders - everyday people without a job or career in finance - through the use of online brokers.

exemplified by the retail trading firm Robinhood, does *not* fulfill this equity ideal. I further articulate how Robinhood - by way of its business model and app design and user interface - actually has detrimental effects on equity in financial markets. I offer several approaches to solve this failed democratization project: fixes to the market itself and other proposals for meeting the need for democratization.

Markets for goods and services outside of the financial sector are the usual targets of contemporary *philosophical* analyses of markets. There is much to be gained, however, by directing normative attention to financial markets in particular. Debra Satz' ideas of institutional and intrinsic corruption - originally articulated in the context of privatization of governmental responsibilities - is a good place to start. These concepts can help us identify flaws in our current financial market structure and potentially suggest some solutions. Satz outlines three distinct forms of corruption: *individual* corruption, "the pursuit of private gain or private benefit by a public official or by any person in a public role in exchange for promoting their private interests"; *intrinsic* corruption in which a good is treated in an "inappropriate way"; and *institutional* corruption, in which "the purposes of an institution are undermined over time."[5] Scandals involving corrupt financiers like Bernie Madoff (ran a Ponzi scheme), Jordan Belfort (the 'Wolf of Wall Street'), and Kenneth Lay (of Enron infamy) feed popular narratives of finance as a 'high-octane' and cutthroat industry. Perversely, pop culture's fascination with Wall Street corruption distracts from the institutional and intrinsic corruptions that exist within finance.[6] Scandals in stock markets that reach the public sphere are, most frequently, regarded as simple instances of individual corruption, whether that be on part of a ratings agency, rogue trader, or corrupt investment fund manager. I posit that these instances of corruption are in fact

[5] Satz, "Markets, Privatization, and Corruption," 993-1008.
[6] It might also glamorize behavior that attracts those prone to white collar crime to the industry.

representative of broader, systemic tendencies to institutional and intrinsic corruptions, tendencies that can undermine the integrity of the market itself while victimizing everyday investors. Using Satz's taxonomy from "Market, Privatization, and Corruption," I diagnose the trouble with current trends in 'democratization' as more than individual corruption, but rather as kinds of institutional and intrinsic corruptions.

Robinhood makes it cheaper and easier for 'regular folks' to get into finance. In some sense, merely increasing participation in the market does 'democratize' it. Unfortunately, it also creates an environment more similar to a casino than an auction, distracting finance professionals with the lure of easy new money. This is a sort of 'internal criticism': financial markets *can* be a force for good, but only as long as they operate to meet their own appropriate goals of efficiently and productively allocating capital resources. When our society's capital distribution mechanism is treated like a casino, a form of entertainment - as it frequently is - we see this process of institutional corruption. Under such conditions, the products in the finance marketplace - partial ownership in companies and other derivative instruments - are treated trivially as mere playing chips, an instance of intrinsic corruption..

Worries about institutional corruption of financial markets are not completely novel. Wealth generation can come apart from the allocative purpose of the market and this hasn't gone unnoticed. Alvin Roth has written on the phenomenon of high frequency traders spending millions of dollars to set up technology that will allow them an advantage over others. Small differences in price between the futures contracts traded on the Chicago Mercantile exchange and those securities' equity prices on the stock exchanges in New York can yield small profits on each trade by "frontrunning" buy and sell orders. Traders seeking to arbitrage this difference faster than their competitors created an unproductive race to build the fastest cable to transmit

information.[7] While hiring construction companies to build fiber optic cables between New Jersey and Chicago is not unethical behavior *per se*, that the market incentivizes behavior unrelated to its role in resource allocation is undoubtedly an undesirable outcome. As Roth notes,"It may not be a problem that faster traders can make more money, but it certainly isn't good news that billions of dollars are spent on faster cables that don't make markets work any better or provide any other social benefit."[8] The tendency of financial markets to corrupt can only be mitigated with intelligently designed adjustments to the system that align profitability with ethicality. Such behavioral and structural changes can originate from market participants, technology providers who create the platforms used by participants, or market regulators.

In section one of this paper I will describe the role that financial markets play in the economy- their *telos* or idealized purpose. In section two I will address the most recent - and most common - development in the 'democratization' project and explain why it has failed, ultimately undermining appropriate capital distribution to some degree. Section three will address potential solutions to the failures of both institutions and technology providers.

[7] As brought to the attention of the broader public in Michael Lewis' book *Flash Boys*, a fiber-optic cable was installed between the Chicago Mercantile Exchange and the Nasdaq exchange's data center to lower the time for data to be transmitted from one to the other from 14.5 milliseconds to around 13 milliseconds.
[8] Roth, *Who Gets What and Why*, 84.

Section 1: The *Telos* of Financial Markets

The 'invisible hand' conception of markets asserts that, given a certain set of conditions, the pursuit of self-interest on part of market participants will yield a socially optimal allocation of scarce resources. The conditions in question are known collectively as "perfect competition": no interdependencies amongst agents' utility functions (e.g., my utility doesn't go down just because yours goes up); markets for goods and services are complete, such that all utility functions can be addressed in the market; no barriers to entry into or exit from a given market, so that no one is 'trapped' in a market; and a sufficient number of traders such that no single agent may influence prices (i.e., no one has market power). Under conditions of perfect competition, market transactions will be *Pareto improvements*: the results of a transaction will be strictly preferred by at least one person and no one will strictly prefer the pre-transaction situation. As a result, the equilibrium allocation that results from a market under conditions of perfect competition will be *Pareto optimal*: no further Pareto improvements will be possible. This result is known as the First Fundamental Theorem of Welfare Economics.[9] There is a lot to be said about this result. The conditions of perfect competition are clearly an idealization - preferences are sometimes entangled. markets aren't always complete (you can't buy salvation!), people can have market power to various degrees, but the basic idea that many transactions mutually satisfy preferences points to a way that markets generally help people pursue their goals.

Functioning markets achieve these desirable results because they are, among other things, signaling mechanisms. They indicate who desires what, who has what, and thus serve as means of spreading information. This information allows markets to appropriately allocate resources in some sense - they go where they are most highly desired. Prices are traditionally viewed as a signalling mechanism for value and can be suggestive of further action - increasing price

[9] Hausman and McPherson, "Preference satisfaction and welfare economics," 1.

indicates increased demand or falling supply for a given good; decreasing price indicates falling demand or rising supply for such goods. Comparing the price trends of a variety of goods provides a picture of changing conditions in the world (e.g., supplies of some kinds of things are getting harder/easier to access) as well as a picture of changing tastes (e.g., people just aren't as interested in buggy whips and VHS cassettes anymore). No one needs to investigate changing circumstances in, say, transportation or entertainment - the prices tell the tale.

The cumulative understanding of a given population, Hayek notes, will always exceed that of any individual agent or body.[10] And, on his view, prices capture all of the relevant (action-guiding) aspects of the total information, at least as far as market behavior is concerned. It is central to Hayek's view that any form of centralized planning will fail to have access to all relevant information. "Planning" itself is the real problem then, not just centralization. In a decentralized market with many independent participants, however, price movements dynamically reflect the changes in preferences of its constituent participants. Consumers who are willing to pay a given price receive a good or service; products which are most in demand generate the highest incomes for their producers. Once prices make the capacities and desires of market agents clear enough, those desires will motivate mutually satisfactory transactions. Or at least that is what is supposed to happen in a market with rational agents - they engage in Pareto-improving behavior.[11]

In this market narrative, financial markets serve as a mechanism to efficiently and productively distribute resources in the form of capital. Investors use their limited capital to invest in businesses they think will be successful. The prices of individual securities are seen as

[10] Hayek, "The use of knowledge in society," 519-530.
[11] This is an idealized mechanism often criticized on the basis of its reliance on normative Pareto improvements - see Ellis, "Pareto Optimality". It will suffice here for mutually satisfactory transactions to be regarded as generally good, even if they are not invariably good.

indications of a company's value, an indicator that reflects the judgment of a whole host of people. This information allows resources to be allocated where they will yield the maximum economic value. Companies with innovative ideas are given capital by investors to create products, expand business lines, acquire other businesses, etc. Those companies succeed or fail in realizing their ideas. When they succeed, consumers with the highest demand acquire the product, and investors are given their money back plus some extra - some of which is presumably used to continue finding innovative ideas to invest in. This straightforward account of financial markets sees them as allocating monetary resources to high-value uses. This rewards and encourages consumer-market innovation in both products and processes. At the same time consumers benefit by having access to ever improving new technologies and products. The market enriches successful investors, providing incentives to stay in the finance 'game', as well as deterring those who don't succeed.

The foregoing is more than a mere descriptive account of how financial markets operate. It is an account, rather, of what such markets do when they are working correctly. Distributing capital to high-value uses is the *point* or *purpose* of financial markets. Philosophers will recognize this sort of account from virtue approaches to ethics. These sorts of views try to articulate the purposes and goals of an entity or practice in order to critique and improve it on those grounds. The value of such an approach has historically been more easily accepted by those in philosophy, with less uptake from those in other disciplines. Some economists, however, have begun to appreciate using this virtue framework - notably Bruni and Sugden. Their view- explicitly inspired by neo-Aristotelian virtue ethics - articulates the *telos* of a market as mutual benefit.[12]

From the conception of the market advanced by Bruni and Sudgen, it follows that a

[12] Bruni and Sugden, "Reclaiming virtue ethics for economics," 141-64.

market's virtues will include traits that make individuals better at enacting mutually beneficial transactions. Using a virtue-based approach, we can use the foregoing outline of (idealized) financial market mechanisms to point us towards the particular *telos* of the financial sector - the one two paragraphs above. In brief, Wall Street is supposed to underwrite the possibility of beneficial exchange by directing resources in a way that facilitates more and better mutual exchanges. More fully, financial markets are supposed to allocate capital to firms that innovate in ways that make for better transactions, that is, to direct resources to firms that build better (more functional, cheaper, etc.) products. This very standard story about the value of financial markets allows us to see something important about the role they play in our economy and - hopefully - makes appeal to the purpose of Wall Street more plausible.

Advocates of financial markets *also* tout them as a means of wealth creation. This is connected, of course, with the idea of mutual benefit - successful investing is often lucrative for many. Paradigmatically, companies get upfront capital for exciting new ideas, and once those ideas come to fruition the investor is rewarded with a healthy return on their investment. Everyday people are encouraged to buy into the market - either as traders themselves or investees in various funds managed for them - as a way of growing their wealth.[13] Overall, this *investment-builds-wealth* principle has held true for over a century.[14] From 1965-2019, for example, the annualized rate of return on the S&P 500 index has held at 10% on average.[15] During the twentieth century, U.S. equities had a real return of 4.3 percent between 1921 and 1996.[16] An individual who invests some amount of their excess money (funds they have that they don't wish to spend yet) *could* - under the right conditions - create a great deal of wealth. But

[13] Stock-market invested funds from pensions and 401(k)s are touted as a way to save for retirement, and are incentivized by offering tax benefits. Still, only 32% of Americans were enrolled in 401(k) plans according to the US Census Bureau.
[14] Royal, "Average Return for the S&P 500."
[15] Buffet, "Berkshire's Performance vs. the S&P 500."
[16] Philippe, and Goetzmann, "Global stock markets in the twentieth century," 953-980.

individuals can and do lose money. The (mere) possibility of wealth-building is certainly distinct from the reality of individual wealth building. The reality of wealth building in the market is that to benefit, one must have some wealth to invest and then ignore. Although stock market indices have continued to rise on average, the demographic of individuals with the means to invest some amount of disposable income has decreased, particularly in the wake of the coronavirus pandemic.[17]

Professional traders and other participants in the financial markets tend to see creation of wealth for themselves as *their* ultimate goal in market participation. This justification is distinct from the capital-allocation goal outlined above, even when it is articulated by professional traders. It is worthwhile to distinguish between the point of the financial market as a whole, compared to the component individuals that work in performing stock market actions. The goals of individual agents in the market needn't be the same goals as the market itself. The market itself might need to be structured and regulated to make sure it does its job. Individuals, however, get into the market for different reasons and with different intentions than that of the market itself. Market structure and regulation may help determine who gets involved in the market, but they don't control the motives of participants. Those employed in the lucrative financial sector do not usually seek out those roles from a sense of duty to efficiently allocate capital.

Perhaps implicitly, income-seeking is the *telos* of traders. But it doesn't follow that the market itself is about income-seeking. Appropriate market mechanisms would allow individuals to act in self-interested ways without undermining the purpose of the market itself. Indeed, the whole point of the 'invisible hand' view is that the market can harness self-interest for the public good. Still, most market players don't always want to be confined by market rules and processes. Perfectly competitive markets, for example, are considered an ideal because of their efficiency

[17] Pew Research Center, "The Pandemic Stalls Growth in the Global Middle Class, Pushes Poverty Up Sharply."

properties. Producers on the supply side of an economy, however, do not want to be in a perfectly competitive environment. In such a circumstance, their (economic) profits would be driven to zero. Producers instead seek to differentiate themselves from competitors to gain market (and pricing) power, all to increase profits.

To get a full grasp of the distinction between institutional goals and individual goals, consider service in the military. A country's military services are *for* the protection of their country by use of force. Someone can join the armed forces (voluntarily or otherwise) without being motivated by that objective - and in many cases do. Someone might volunteer for the army to receive otherwise expensive medical training; others might be entirely indifferent to the goals of the military, joining because it is compulsory to do so. Even those who are motivated by the goals the armed forces are often also motivated by more individual concerns. None of that changes the point of the armed forces.

It is in the context of wealth-seeking that the 'democratization' of markets is lauded as an (incomplete) achievement and a further goal by market proponents. More people participating in the market, it is argued, should mean more people reaping the benefits of that participation. The quality of participation is sometimes lost in the pursuit of democratization, however. Democratization might be motivated by everyone seeking wealth, but market participation in the service of wealth-seeking doesn't result in everyone getting wealthy. It is, then, counterproductive to define democratization simply as access for everyday people. Wealth-seeking on the part of financial market incumbents can turn greater market access for non-professionals into a trap that separates the latter from their money.

Further, this 'democratization' that aims at mere wealth creation distorts the capital allocation mission of financial markets. Various market participants are distracted - to some

degree, at least - from the task of finding and supporting businesses that will create benefits.. It is important, then, to clearly conceptualize what society ought to 'get' from the stock market and the broader resource allocative procedures of our society and to distinguish that from the motives of stock market participants. In the finance context, it is important for market efficiency that someone spots and takes advantage of arbitrage opportunities. However, expensive competition to determine *which* market agent gets to arbitrage those inefficiencies doesn't help the markets (so long as those opportunities would be discovered anyway). 'Expensive' competition of this sort diverts resources from other productive market activity. Threats to systems of resource allocation include intrinsic corruption of what is being bought and sold, institutional corruption of actors within the system, and gamification of an industry which amplifies information asymmetries.

These sorts of *telos*-focused normative questions often go unaddressed. This is, in part, because the disciplines of economics and finance are uniquely unfocused on normative issues at all. The evolution of economics within the academy has pushed it more toward quantitative assessment of economic phenomena. Cognitive psychology research has shown, however, that when subjects are given profit-maximizing tools they tend to focus on profits rather than any moral issues. This focus results in a kind of tunnel vision, or what some cognitive psychologists call "bounded ethicality."[18] Several case studies have shown that introducing individuals to profit maximizing tools lead them to make decisions based on profit without performing any kind of ethical analysis of their action choices. In one study, two groups of individuals were given an opportunity to cheat in a way that benefitted them. One group had been given a business decision to consider, while the other group had been told to think of an ethical decision. The group that had thought of the business decision had a greater proportion of cheaters than the one that had

[18] Tenbrunsel and Messick, "Ethical fading: The role of self-deception in unethical behavior," 223-236.

considered the ethical decision. Tenbrunsel concluded that business 'frames' activate certain patterns of cognition geared towards success and competence whereas ethical frames trigger different goals.[19] More generally, there are many ways in which we can deceive ourselves and make unethical decisions in a variety of circumstances. "Moral fading" is the term deployed by Tenbrunsel to explain how, when the mind becomes focused on one particular end (profit maximization, saving one's company from bankruptcy, etc.) the ethicality of our decisions 'fade' into the background. This mechanism shows why traditional ethics training has been unhelpful with these particular problems. Tenbrunsel argues that this style of ethics education misses "the innate psychological tendency for individuals to engage in self-deception."[20]

If normative questions are notably underrepresented in much of the scholarship concerning financial markets, it is unsurprising that the same holds true for practitioners in the field.[21] If anything, inattention to ethical issues seems to be more true of finance and economic professionals than of their academic counterparts. The sense that professional players in the finance game (i.e. hedge fund managers, traders, financial insiders of various stripes) are ethically compromised seems to stem from one of two plausible sources: that the industry itself corrupts those in it or that the industry self-selects for corrupt individuals. Although it is unlikely that any industry elites would consent to participating in research on the topic, similar studies have been done on populations of Economics students. We could reasonably estimate that the economic (and relatedly, finance) profession has a similar problem to the demonstrated self-selection ethical biases found to exist amongst economic students.The evidence suggests that it is not that markets corrupt individuals as much as it is that some set of corrupt - or at least

[19] Joffe-Walt and Spiegel, "Psychology of fraud."
[20] Tenbrunsel & Messick, "Ethical Fading," 223-236.
[21] The attention that is paid to normative questions are usually isolated in the field of Business Ethics, often tacked on to business and management courses but left out of the more quantitative core curriculum.

morally myopic - individuals are attracted to markets.[22] Recent research has connected the phenomenon of unethical business students to the studies about 'moral fading' and 'tunnel vision' noted above.[23] To some extent, *any* high paying profession will attract people who are self-focused, and consequently less ethically-inclined. The financial sector is popularly known for both wealth-seeking and high salaries. It is no surprise, then, that Wall Street would attract people who have no concern for the ultimate purpose of the whole system in which they work. The markets are set up in a way to make individuals more susceptible to tunnel vision towards profits over ethical behavior and moral fading.

The tunnel vision common to professional traders often leads them to focus solely on maximizing their own profits, disregarding the ultimate purpose of their profession. Further, professional traders are more likely to see inexperienced retail traders as mere targets when focused solely on profit. Similarly, inexperienced retail traders can experience a sort of tunnel vision that leads to naivete concerning the risks of their trading behavior. Focusing on the end goal of wealth and the basic mechanics of the trades meant to pursue that goal can distract from the strategic elements of various strategies, leading to less informed and more risky trading decisions.

None of the foregoing means that ethics is actually irrelevant to financial economics, of course. The notion that economics needn't or shouldn't grapple with normative or ethical questions ignores the implicit normative judgements made by those who rely on and implement the positive models. To varying degrees, institutions within finance are based on systems of trust - finance would not exist without some conception of ethical conduct. Modern currency and banking systems would entirely collapse without the trust and acceptance of broader society.

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[22] Frank and Schulze, "Does economics make citizens corrupt?" 101-113.
[23] Rees, Tenbrunsel, and Diekmann, "'It's Just Business'," 1-21.

Industry professionals are required by the Financial Industry Regulatory Authority (FINRA) - the organization that licenses financial professionals as required by the Securities and Exchange Commission- to take one or more Series exams. These exams test new entrants in the field on their knowledge of the rules, regulations, and ethical requirements that apply to the financial instruments they will be dealing with. are required. This is really the only training they receive in ethics. This material is directly concerned with technical rule compliance - the legality of individual actions and recommendations financial advisers might make to clients. There is no training that goes to the purpose of the market, and so no explicit ethical framing that might help financial professionals avoid problematic tunnel vision. Those working in the profession could, in theory, avoid thinking about the purposes of the markets entirely.

Even the limited attention to ethics provided in Series exams seems to help improve behavior. In a recent study of investment advisor conduct, researchers found that Series Exams that include more focus on ethical standards are less likely to commit misconduct in advising their clients. Kowaleski, et al. compared advisers at the same firm location and qualifications during the same year, and concluded that those with ethics training were one-fourth less likely to engage in misconduct. They suggest that the exam content influences not only simple awareness of specific rules, but perceptions of right and wrong too.[24] Still, the evidence from the 'moral fading' literature suggests that we might better address issues of unethical behavior by reframing business decisions to allow those about to make them consider the ethical implications. There is evidence that 'business' frames of mind impair individuals making decisions that influence broader society-improving decisions. Continued research has suggested that 'reframing' individuals to think in ethical terms helps prevent the 'business' frame from taking over. This

[24] Kowaleski, Sutherland, and Vetter. "Can ethics be taught," 159-175.

indicates that improvement in individual behavior is possible.[25] It is frustrating, then, that starting in 2010, the Series Exams replaced some questions about ethics with additional technical questions. As a result, testing standards have actively moved away from a focus on ethical behavior.

In this context, normative criticisms of financial markets are often dismissed as ignorant of their mechanisms. In other words, those within the discipline feel impervious to normative criticism because they feel that normative standards have little use amongst industry professionals - normative standards ought to be upheld by regulatory agencies, if at all. Criticisms of the system itself are usually discounted entirely as ignorant or naive.[26] I appeal to a recognizable conception of the financial market's virtues in the hope that this recognition allows normative issues in the stock market to gain broader appeal.

[25] Rees, Tenbrunsel, and Diekmann, "“It's Just Business”," 1-21.
[26] Occupy Wall Street was consistently portrayed in the media as naive, misguided, and confused by reporters at major new outlets.

Section 2: Robinhood - Great Equalizer or Wolf in Sheep's Clothing?

This paper seeks to contextualize certain developments in retail trading as failures to do what financial markets should do. These developments in the stock market are intrinsically and institutionally corrupt rather than instances of individual corruption. The implications of this corruption of the financial system are vast - retail investors are being institutionally undermined in their attempts to participate in the stock market. Current financial norms undermine the integrity and purpose of stock markets when it comes to everyday investors.

Retail trading is not a new phenomenon. Before the internet age, stock brokers would communicate with retail traders ('everyday' folks for whom trading is not their primary career) by telephone. They were usually charged fees per trade, payment for the legwork of submitting buy and sell orders to market makers. In the last two decades, the telephone has largely been replaced by internet or app-based platforms where individuals can simply click to purchase a stock just like they would make any other purchase on any other digital marketplace. Still, prior to the emergence of Robinhood, even most online brokers still charged a fee per trade - usually $15 or so. This was not a real financial barrier for people with income to invest in the market, but was probably enough of a *nudge* to weed out frequent trading as a hobby or form of entertainment.[27] Trading began its transition online in 1971 with the creation of the first electronic exchange NASDAQ.[28] Although the exchange itself was executing orders electronically, trade orders from market makers and institutional investors were still largely conducted over the phone until the mid-1980s. Advances in technology made it possible for retail traders to access the same price information a decade later, although they were importantly not able to receive the same execution as institutional traders. Financial consulting became less

[27] Thaler and Sunstein, *Nudge: Improving Decisions Using the Architecture of Choice,* chap 5.
[28] Friedman, A. "About NASDAQ."

popular with the rise of more easily accessible exchanges and brokers made available over the internet. Brokers like ETrade, Charles Schwabb, and Fidelity cut into the business models of once hugely profitable brick and mortar financial advisors. A similar transition from mutual funds and similarly passive professional investment products has been seen in the last decade with the rise of Exchange Traded Funds (or ETFs).[29]

Robinhood was founded in 2013, advertising itself as a revolutionary new way to lower some of the barriers for individuals to participate in the stock market. Taking its name from the famous literary character who promised to 'take from the rich and give to the poor', Robinhood allows users to buy and sell stocks *and options* with zero commission fees and zero minimum portfolio value on a free app. Unlike most retail brokerages, Robinhood does not support bond or mutual fund investments on their platform. Those two asset classes are universally considered to be safer than equities or options. The brokerage had one million active users in 2016, which increased dramatically to 13 million as of May 2020. They now have more users than longtime brokers like E-Trade and Charles Schwabb, who have 5.5 million and 12.7 million users respectively.[30] At the time of Robinhood's founding, its competitors charged around $15 per transaction and had minimum portfolio sizes. Since Robinhood entered the market, zero commission fees have become the industry standard.

Robinhood's app has fewer data tools than its competitors, substituting them for popularity boards and rudimentary data metrics. A comprehensive review of the 11 most popular zero-fee brokers found that while Robinhood gives users information on only four technical indicators (price, volume, moving average, and relative strength[31]), competitor TD Ameritrade

[29] Ballentine, C. "Traders Ditching Mutual Funds Stoke ETF Assets to a Record."
[30] Rooney and Fitzgerald, "Here's How Robinhood Is Raking in Record Cash on Customer Trades."
[31] 'Relative strength' is a momentum indicator that uses price changes to determine if a given security is overbought or oversold.

gives users over 400 and TradeStation has over 300. Robinhood ranked last for both 'Trading Platform and Tools' and 'Research' while ranking first for 'Ease of Use.'[32] There are several implications for this stark difference in availability of technical indicators. Many successful trading strategies use some proprietary combinations of indicators to predict market movements. Different firms and traders make trading decisions based on different quantitative changes. By only giving users four of these, Robinhood is systematically eliminating the ability of their users to formulate any trading strategy substantially different from what other Robinhood users might be using, or even to strategize in light of less rudimentary trade ideas. This lack of quantitative data further reinforces the culture of stock market trading as entertainment based on temporary emotion or sentiment among other inexperienced retail traders.

Research has shown that traders who try to try to profit from small, short-term fluctuations in securities prices - often termed "day traders"- usually lose money, even the professionals. In a data set using trades from 1998-1999 (i.e. before smartphones and Robinhood and pandemic boredom…) Jordan and Diltz found that only 20 percent of day traders were more than marginally profitable.[33] The degree of difficulty for active retail traders is surely greater. In recent congressional testimony, Robinhood CEO Vlad Teniv stated that Robinhood users had earned $35 billion in profits on the trading app. But he didn't disclose what the actual rate of return $35 billion indicates or whether users would have made more or less than $35 billion by investing in safer securities. Research by Barber, et al. indicates that the most popular stocks on the Robinhood app (top 0.5%) lose almost 5% of their value over the next month.[34] When looking at Robinhood user portfolios, the authors argue that oversimplified information and the gamification of the app are responsible for users "performance chasing" - as opposed to

[32] Stockbrokers. "Best Trading Platforms of 2021."
[33] Jordan, and Diltz, "The profitability of day traders," 85-94.
[34]Barber et al. "Attention Induced Trading and Returns: Evidence from Robinhood Users."

performance anticipating trades. By identifying when many users were buying into securities because of their popularity with other Robinhood users, the authors were able to identify certain "herding" events. Researchers looked at the change in number of users with long exposure to a given stock, regardless of how large their position was or how expensive the stock was.[35] The top 0.5% of stock purchased by users each day - measured by the increase in the number of users owning a given stock - experience negative average returns of 4.7% over the following 30-day period, and more extreme herding events were found to have negative average returns of 19.6%.[36]

The phrase "stock trading" - when used colloquially - includes several distinct market activities. It is often employed in a manner that conflates two quite different things: (1) the buying and selling of actual shares of companies, and (2) derivative trading - an umbrella term used to describe financial instruments that derive profit or loss form the price movement of some underlying security. Options contracts are a type of derivative and are more accessible and popular due to their ability to be traded on exchanges. I describe simple 'vanilla' options below, but many more complex combinations of these simple options are made to engage various trading strategies, and there are many far more complex and bespoke derivative products available to mostly institutional traders and clients. In its most basic form, making money by buying and selling stocks is relatively easy to understand - to successfully make money on a security, you buy the stock when it is at a 'low' price and sell it when the price is higher, pocketing the difference in the prices as your reward. The profitability of options is more complex, being based on the price of the underlying stock, the price of the options, and the time before expiry of the options. Although there is not a wealth of research to analyze, it stands to

[35] In this study, researchers would weight 100 users with new purchases of a single share of some stock as 100 times more significant than 1 user with a new purchase of 100 shares of some stock.
[36] Pisani, "Attention Robinhood Power Users: Most Day Traders Lose Money."

reason that more complicated derivatives trades require more expertise and are relatively more dangerous for retail traders. The limited data that has been collected supports this view. The online investment advising company SigFig found that of 200,00 retail traders, those that traded options made one fifth of the returns of those who avoided options trading.[37]

The umbrella of derivatives is vast and complex, but the derivatives most accessible by retail traders are *options*. Options contracts give participants rights or obligations to buy or sell a specific security at a specific price. One party charges the other for the obligation they incur or the right they grant. Options can be either *Puts* or *Calls*; one can express confidence in a stock price (take a *long* position) or express pessimism (take a *short* position) with either sort of contract, depending on whether they are a buyer or seller. The Call and Put contracts themselves are sold for some premium. If a trader is long on a security (they think the price of the security will go up) they can buy Calls and/or sell Puts; if they are short on a security (they think its price will go down) they can buy puts and/or sell calls.

A Call contract is the right to purchase a security at some price *x (the strike price)*. The purchaser of a Call contract is said to be long in the security since they benefit when the security price exceeds the strike price. If the price of the security does in fact rise, they will be able to purchase the security at the strike price of their call, sell the security in the market at some higher price, and the profits from such a trade will be the difference between the market price and strike price, minus the premium they paid for the option contract itself.

The seller of a Call contract is said to be short in the security because they don't expect the price of security to exceed the strike price - they would prefer to keep the security if they thought it's price was going to exceed the strike price. In selling a call, the trader will profit on the premium she sold the contract for, but runs the risk of infinite losses if the stock price

[37] Popper, "Growth in Options Trading Helps Brokers but Not Small Investors."

actually rises instead of falls (this is not the case in selling puts, because a stock price can only hit $0). They don't expect the call option to be exercised and so they are being paid for an eventuality they don't think will come to pass.

A Put contract is the right to sell a security at some price *x (the strike price)*. The purchaser of a Put contract is said to be short in the security since they benefit when the security price is lower than the strike price. In buying a Put, the trader is purchasing the right to sell a stock at a given strike price. If the stock falls below that price, the buyer of the put will execute the option, forcing the seller to buy the stock at the (now overvalued) strike price. The buyer can then sell the security at the (lower) market price, and will make a profit between the strike price and market price, minus the premium paid for the option contract.

The seller of a Put contract is said to be long in the security because they don't expect the price of security to fall below the strike price. If they have sold puts and the stock price rises, they will have profited from the premium they sold the Put contracts at, and the contracts will remain unexecuted (as they have turned out to be unprofitable from the perspective of the trader that has purchased them). They don't expect the put option to be exercised and so they are being paid for an eventuality they don't think will come to pass.

This is the most basic (or ‘vanilla’) form of options trading, which is only one form of many kinds of derivatives trading. Still, we can see how these contracts can trade differently compared to the buying and selling of the actual securities. There are obvious differences in the structure of the trade, and what information might be used to form a trade idea, but the most dangerous aspect of allowing retail traders to trade in options is not the technical structure of them, but the market in which they are bought and sold. Compared to the market of physical securities in which there are buyers and sellers interacting with a wide variety of skill levels and

sophistication, options markets are traversed mostly by expert traders, and as such retail traders are more likely to be on the losing side of options trades. Adverse selection can happen when one party to a deal has access to better information than another counter party. To see how this works, consider a used car dealership: as the dealer knows, they don't have a lot of randomized cars, but more likely the worst subset of cars of that age, model, and make; prospective buyers must be aware that they are choosing a car from this set. Adverse selection is why insurance providers are usually thought to be at a disadvantage in calculating the risk premium of a given client - less-healthy people will tend to buy insurance more than healthy people. Adverse selection considerations alter the analysis of even simple options trades.

Position	**Action**	**Pros**	**Cons**
Long	Buy Call Option	Cheaper than buying physical[38] stock	Could expire worthless; adverse selection
Long	Sell Put Option	Earn profit if unexecuted	Risk if stock goes to 0
Long	Buy physical stock	Ease of action; less adverse selection	Expensive
Short	Sell Call Option	Earn profit if unexecuted	Risk as stock goes to ∞
Short	Buy Put Option	Least risky option to short for retail traders	Could expire worthless; adverse selection
Short	Short physical stock	Smaller market, sometimes cheaper than options	Only available to institutional clients

In practice, trading options and trading physical stock operate in different ways. While there are serious criticisms to be made about derivatives markets in general, this paper will only focus on simple 'vanilla' options that make up the bulk of retail traders' derivative trading. Such traders regularly overleverage themselves in a market dominated by more sophisticated institutional players. The derivatives market in general receives widespread criticism. It is often compared to gambling. This criticism is not unfounded, but it misses a critical role for these arrangements. They can be useful to the normal, non-speculative operations of many businesses. Derivatives - particularly in the form of simple or 'vanilla' options - can serve as a means of risk management or insurance. One commonly cited example is of an airline company which purchases a combination of options or futures contracts on oil to hedge their exposure to the fluctuating cost of jet fuel. In this case, the airline (partially) protects itself (and, in theory, its

[38] Here, 'physical' is a term used in the industry to distinguish purchasing shares of a stock instead of a 'synthetic' derivative. The latter includes but is not limited to the options discussed in this paper.

customers) from any negative impact due to an increasing price in oil.[39]

On the whole, derivatives can play a helpful role in financial markets, but it does not follow that everyday Robinhood users ought to trade them as they are undoubtedly complicated and require expertise. As noted above, the human capacity to experience 'moral fading' in the presence of profit goals can result in worse outcomes for inexperienced retail traders. Greed and hubris can get naive traders locked into tunnel-vision on profits, a perspective that might undermine their performance. And the opportunities for a retail investor to get in over their heads are growing. Robinhood has recently stated that they are developing a way for its users to invest in initial public offerings (IPOs) - a process through which companies list stock on public exchanges. Robinhood consistently represents broader access to and use of complex financial instruments as a noble step towards "democratization" but there are important reasons why IPOs have traditionally been limited to large institutional investors. For other publicly traded companies, individuals usually conduct research on a given company's business model and their stock's performance. With IPOs, this information does not exist. Even the basic company fundamentals are more difficult to parse with far fewer reports made by financial analysts. Information is far more asymmetric in IPOs than in other financial market interactions. Without market data to go off of, investors really have to dig into other resources, and such research might require access to information and modelling that an inexperienced retail trader is unlikely to have.

For related reasons, IPOs are also more susceptible to emotive, hype-based trading like

[39] If, for example, I own a business that spends $100 per month on oil (let's imagine 100 gallons at $1 per gallon), and there is a 50% chance that the price of oil could double to $2 per gallon (for an expensive of $200 of oil), I would be willing to pay some amount of money protect myself against that price exposure. I might buy calls at a $1 strike price that cost 10 cents per gallon, so that if the price of oil increases I can still purchase oil at $1. If oil does increase in price, then I will still be paying $1 per gallon plus the 10 cents I spent on each options contract. I spend $10 to avoid a (possible) $100 loss if the price of oil does double.

that seen in the meteoric rise of GameStop.[40] This kind of trading has often occurred without evidence to support such inflated volumes and prices or, in some cases, in spite of evidence that indicates prices are unjustified. As online communities develop to discuss trade ideas, they are prone to adopting an optimistic and enthusiastic narrative without appropriately assessing the risks of their trades and trading behavior. This again highlights the impact of our own cognitive psychology, tunnel vision towards profit can lead inexperienced traders to overvalue the advice they read on internet communities like r/WallStreetBets.

Mechanistically, having a large crop of enthusiastic and unskilled investors (a type of trader I will discuss in more detail below) might invert the typical performance of an IPO on issue date. IPOs usually have a 'pop' on trading day. This dynamic is usually indicative that the security was underpriced to initial investors, and once on the market existing 'pent up' demand (as a result of the IPO only being accessible to a small group of investors prior to the stock's issuance) causes some increase in the price of the IPO on its first trading day. However, if the IPO is open to a larger, less critical audience, the opposite dynamic could become more prevalent. If enthusiastic and unskilled investors are motivated to purchased shares of an IPO because they believe something like 'all IPOs increase by double digit percentages within the first day of trading' it is likely that the IPO will begin trading far higher than where the more experienced agents in the market believe it should be trading at and the expert investors in the IPO will sell, leading to a steep decline in the price of the security on the first day of trading. In this scenario, the 'pop' occurs before trading begins, and the enthusiastic unskilled traders will be left holding the security after the stock falls.

Allowing individuals to trade options contracts or participate in IPOs without any

[40] The phenomenon of individuals trading more on enthusiasm than analytics can also be seen in the wild popularity of blockchain securities like the cryptocurrency Dogecoin and the new sector of non-fungible tokens.

education or warnings as to their danger is similar to a local car dealership having Formula One race cars for sale. Race cars can indeed get someone from Point A to Point B faster, but it is also more likely that they might get injured in the process. There are experts who know how to use the racecars, but it is unlikely that a non-professional would be able to successfully use one.

At first glance, it is hard to see how Robinhood can stay afloat by producing a free trading app that charges zero commission fees and has no minimum portfolio size. How could such a strategy be profitable? Robinhood makes money from a few sources that are basically invisible to the untrained eye.[41] First, Robinhood gets paid for *order flow*. In other words, it routes its orders through high frequency trading firms - also known as 'liquidity providers'. Such firms pay retail brokers for their customer orders. These orders can be attractive for a number of reasons. Because their number is small, in terms of the whole market demand, and is less likely to be correlated with an overall shift in the market ("adversely selected" the traders would say), this makes orders from retail brokers easier to 'pair off'. The result is that liquidity providers can buy order flow as a sort of insurance policy. An expert institutional trader might sense, for example, that there will be a dramatic sell-off (and price decrease) in a stock and sell a large quantity of it. If that trader's sell-off is in fact followed by a large decrease in price, particularly if it is over a short period of time, the liquidity provider who actually executes the trade could face large losses in trying to do so. Paying for order flow mitigates that risk. Proponents of this practice argue that it can help retail customers with getting good execution prices, and indeed it *could*. However, the Security Exchange Commission recently fined Robinhood for failure to guarantee best execution on their customers' trades.[42]

[41] The SEC is currently investigating Robinhood for failing to disclose their payment for order flow practices to users until 2018. Robinhood now discloses these three methods on their website, but without broader knowledge of financial market mechanisms, the average user is unable to parse what implications these practices have on their interests.

[42] Financial Industry Regulatory Agency, "FINRA Fines Robinhood Financial, LLC $1.25 Million for Best Execution Violations."

Insurance, however, isn't the only reason why order flow is bought and sold. Clearly orders from Robinhood provide information about what their traders are doing. Robinhood is paid far more for their order flow compared to its competitors. This suggests that high frequency trading firms have particularly good predictive models of the average Robinhood user's tendencies and so they know how to make money off of them when they learn how they are trading.[43] Critics of the practice argue that payment for order flow is analogous to a casino (Robinhood) selling a set of elite gamblers (institutional traders - folk for whom trading *is* their primary career that occupy a role within an institution like a bank, hedge fund, pension fund, etc.) a list of the cards a Vegas tourist (Robinhood users) is about to play.

The foregoing analysis of the payment-for-order-flow issue is made even more plausible by the fact that Robinhood, like many social networks, makes money by directly selling user data. Unlike order flow data, this information has become its own tradable product, entirely extraneous to the primary brokerage business of the company. Third-party companies like Robintrack aggregate this data to show trends in price and popularity. This data can be used to predict user behavior, all for profit. This data is technically available to anyone, but it is most useful for institutional traders that have the means to analyze and trade on this data.

Research into the ethical use of consumer data, and the market for such data, is becoming increasingly pertinent as individuals spend more time and interactions online. While regulations on the protection of consumer data have been successful in the European Union in some instances, the market is vastly underregulated. Some literature argues consumer data collection and aggregation is unethical because of its ability to be used as a predictive analytic technique to sell things to consumers. 'Consumer scores' are used to predict buying behavior and to

[43] In Q1 2020, Robinhood was paid $0.24 per 100 shares of equity and $0.48 per 100 shares in options, compared to $0.11/$0.36 (Equity/Options) for Charles Schwabb and $0.16/$0.45 for E-Trade according to an SEC filing

determine if a consumer is likely to pay off debt. Privacy questions and questions about inherent corruption dominate current conversations around data ethics. The ethical questions raised by the market for Robinhood-style information are somewhat distinct: the sale of retail trading data isn't like vote selling - it doesn't undermine the social meaning of the 'product' - or selling friendship - it doesn't create an incoherent market. Rather, selling retail-trader data puts those traders at increased risk when they engage in what would otherwise be normal financial market transactions. A retail broker who sells trader data is treating their supposed customers as a product.

Certainly, elite investors are more informed and savvy in the market, but that certainly doesn't give them any right to the advantages they can gain by access to information on other traders in a market. Robinhood's publishing of this data is particularly problematic because, if it became industry standard, it could undermine the valuable anonymity of traders in the market. If it becomes clear who is behind a certain trade or set of trades, other actors might be able to manipulate that trader by using knowledge of their financial situation (e.g., if they are a brokerage, knowing the amount of leverage they have) to change their profit outcomes. The saga of GameStop stock (GME) in the first quarter of 2021 was spurred by the discovery of Melvin Capital's short position in GME through a 13-F filing.[44] This information was used by retail traders - mobilized largely on Reddit groups like r/wallstreetbets - to target the fund itself. The underlying value of the security they were trading was secondary to their use of it to instrumentally harm another market participant. There was little sympathy for Melvin Capital in what appeared to be an archetypal David-vs-Goliath contest. The mechanism by which publishing trader data could allow savvy traders - retail or institutional - to target each other was

[44] Hedge funds are required to report their short positions on a quarterly basis.

made clear.[45] The data that Robinhood sells is, therefore, *intrinsically* corrupt.

Robinhood also generates revenue from 'renting' users' stocks to prime brokers who facilitate hedge fund short positions in what is called a 'stock loan' program. Individual investors go short by selling Calls or Buying Puts. Big trading firms can go short, however, by reversing the order of the traditional *buy-low-sell-high* formula. In order to *sell high* before *buying low*, however, a firm has to put its hands on some shares to sell. That's where the stock loans come in. One can sell the borrowed stock now and return (hopefully lower-priced) stock purchased later. This is not, of course, a Robinhood 'innovation'. The 'stock loan' mechanism has been industry practice for decades, and is used by passive investment funds (pension funds, ETF funds, etc.) to generate marginal return on less frequently traded assets. Robinhood's use of the practice is troubling, however. To see why, consider the pot stock bubble in 2018. Retail traders were eager to purchase stocks in companies involved in the newly legalized marajuana industry - regardless of how relatively 'cheap' or 'expensive' these stocks were trading. Institutional traders, seeing the making of a stock bubble, began to short these securities.

Here's a simplistic account of a common sort of short selling: to short a security, at time t a trader borrows the stock from a counterparty (usually a prime broker) and sells that borrowed stock in the market (at what they presume to be an 'inflated' price relative to what they think the security is worth). For each day that the short seller borrows the stock from a counterpart, they are charged some fee. This fee is higher for securities that are popular to short, and lower for very liquid securities. Later at time $t+x$, the short seller will purchase the security they borrowed from the market (if their trade was correct, this price will be lower than the price they originally sold the security at in the market) and their profit will be: *the price of the security at t - price of*

[45] It may be worth the risk for the SEC to require 13-F filings - there are benefits to making this information available. Private trading in user information, however, doesn't seem to offer the same sort of public benefits.

security at (t+x) - the fees they've paid to borrow the security. When a number of traders short stock in this way, it increases the cost to short these stocks because the demand for borrowed stock rises. Brokers like Robinhood profit from institutional and retail traders having opposite opinions on the price direction of a stock. If it's popular amongst institutional traders to short Stock ABC which retail traders happen to own, the fees to borrow Stock ABC will be higher than another company without popularity amongst retail traders.

During the pot stock boom, retail traders were buying marajuana stocks - pushing the prices of them far above what institutional traders thought they were actually worth. The more shares purchased by retail traders, the more supply of shares there were to short by hedge funds. This is a somewhat natural phenomenon - everyday folks that trade stocks in their free time often get excited about news on a given stock and purchase it without doing much research on their price relative to other fundamentals. A trade is considered to be 'crowded' when it is held by a large number of traders for similar reasons usually resulting in price action that exacerbates sell-offs and hinders individual opportunity to profit. If a large number of traders buy a stock at time t with the idea that the price will increase at $t+x$, the price of the stock will rise prior to the event at $t+x$, lessening or negating the profit for the many traders with similar trade ideas. This sort of crowded trading makes trading on enthusiasm a less profitable strategy. Perhaps more importantly, professionals see this phenomenon and short the same security, understanding it to be overpriced. However, the gamification of Robinhood's user interface, and prominent display of metrics like the relative popularity of a stock amongst other users incentivize and influence other retail traders to buy what are often already inflated stocks. Robinhood is able to directly profit from promoting these poor trades.

Robinhood has faced criticism (and legal action) for the practices above, albeit mostly

from industry professionals and regulators and not their actual users.[46] The hedge fund investor Adam Sender referred to his firm's bets against Robinhood traders as a key factor in their 30% profit improvement.[47] High frequency trading firms and hedge funds assume - usually correctly - that Robinhood users are making trades more frequently and with less care than their institutional trader counterparts. Some of the institutional traders buying Robinhood user data have explicitly disclosed this strategy. Retail traders are playing the role of 'dumb money' that serves as a foil to the 'smart money' institutional traders. Where institutional traders can analyze data and find that retail traders are less informed and more prone to error then they can consistently take the winning sides of options trades. These practices often materially, and permanently harm the outcomes of their users.[48]

At a minimum, Robinhood's platform encourages active trading in a market that has consistently shown that more frequent trading results in fewer profits.[49] As of February 2019, 81% of Americans owned a smartphone - up from just 35% in 2011.[50] Within the demographic of smartphone users, 92.8% of millennials use their mobile device for banking, compared with 49.8% of Baby Boomers.[51] Millenials have trust in using their phones for finances. This trust is abused by Robinhood by making a gamified app. Robinhood uses tactics similar to Facebook in order to keep users engaged on the app. There are several means by which games and apps are made addictive - many of which have been utilized in the design and implementation of Robinhood's trading platform. Studies have shown, for example, that the brain responds

[46] At least one Robinhood user has filed suit against the company for reasons unrelated to their basic profit mechanisms when their platform crashed in mid-March as a result of the COVID-19 selloff. see Rooney, "Robinhood Client Files Class-Action Suit for Negligence Over Outages."
[47] Levine, "Running a Hedge Fund Isn't All Bad."
[48] In one particularly stark example, a 20 year old user committed suidice after the full-time college student posted losses of $730,000 from complicated options trades. see Egan, "Lawmakers Slam Robinhood after Apparent Suicide by 20-Year-Old Trader."
[49] Pisani, "Attention Robinhood Power Users: Most Day Traders Lose Money"
[50] Pew Research Center. "Demographics of Mobile Device Ownership."
[51] Statista. "Share of digital banking users using mobile banking in the United States in 2018, by generation."

positively to variable rewards - when we receive some random or unpredictable output for a given input.[52] The unpredictability of these rewards produce more dopamine than rewards given with standard frequency or size. This phenomenon is seen in the popularity of slot machines, and in recent years has been adopted by app notifications. In intensifying these dopamine surges, app and web developers make using their platforms or products more addictive. The stock market is intrinsically a variable reward system - sometimes the value of your portfolio will be up, by some variable amount and other times it will have gone down. By engaging users in their app so thoroughly, Robinhood makes this variable reward system very salient.

The literature also suggests that apps with continuous scrolling 'news feeds' or user posts tend to engage users for more time compared to applications or websites where users have to click through 'pages' of content.[53] Robinhood's app features a news feed similar to that of Facebook or Instagram, where users see performance graphs of various stocks they own or have added to their watchlist and associated news articles. Robinhood also exploits the 'Illusion of Choice' utilized by other apps like Yelp. When searching a given map area for restaurants, Yelp shows users some small selection of establishments. Importantly, it is not a list of all establishments in a given area. Yelp's users then make some comparative judgements (based on location, price, cuisine, etc.) and are left feeling as though they have made the optimal selection. Their choice of restaurant feels better for their having selected it as opposed to it having been chosen at random. Presenting a limited number of options is sufficient to increase engagement.[54] Robinhood's news feed and popularity rankings present a similar dynamic. Robinhood users see some number of stocks, and perhaps after scrolling through a few decide on one to invest in, feeling as though they have done due diligence. But it is not the case that they have made these

[52] Neyman, "A survey of addictive software design." .
[53] Ibid.
[54] Iyengarand and Lepper, "When Choice is Demotivating," 995.

decisions from the available pool of securities to invest in- their choice has been heavily influenced by Robinhood's user interface. In both cases, the user might be making the best decision given the options made available to them *by their respective apps*, but not the best decision given the number of options *actually* available.

Gamification takes non-gamelike aspects of an app and makes them more like a game. This type of design is so popular (and successful at increasing engagement) that companies from Snapchat to Uber have gamified aspects of their app to increase everything from time spent using the app to duration and length drivers are willing to work in a single shift.[55] Robinhood presents confetti on the screen when users first open accounts, and presents each new user with a 'lotto card' where they 'scratch-off' a square to reveal what free stock they've won as a first-time user. Although most brokerages now have mobile apps for phones, they are largely as austere and boring as their web-based counterparts. These techniques combine to make Robinhood's app more addictive, particularly to young adults.[56]

As a recent Bloomberg story has uncovered, some millennials have turned to using Robinhood and the stock market as a replacement of their previous sports betting habits in the wake of the COVID-19 pandemic.[57] Unable to go to sports bars or bet on professional sports teams whose games were postponed or cancelled, one college student who normally spent $50 on sports bets per week now trades stocks and options on Robinhood and checks his holdings more than a dozen times during market hours. In reference to the rush of exhilaration he would experience betting on sports, "When I started putting the money into Robinhood, then I started feeling that same rush."[58] These traders explicitly acknowledge that they're using the market as a

[55] Scheiber, "How Uber Uses Psychological Tricks"
[56] Barnes et al. "Comparisons of gambling and alcohol use among college students," 443–452.
[57] Massa and Ponczek. "Robinhood's Addictive App Made Trading a Pandemic Pastime."
[58] Ibid.

form of entertainment, and do not see the money they put into the market via their Robinhood app as any kind of sound investment into their own financial future. Even apart from the pandemic, this phenomenon suggests that some Robinhood users frame their interaction with the market as a kind of social media expression or gaming entertainment rather than as a matter of serious research about firms. And Robinhood's presentation to their users is part of why they see their situations this way.

January 2021 and the following months have provided a historic case study in how the gamification of trading can have incredible effects on our financial institutions and structures. Driven by the internet culture and entertainment industry now surrounding the financial system, a group of retail traders has coalesced to invest in shares of certain companies - the most famous being GameStop - that are by every quantitative measure, struggling at best.[59] This is not dissimilar from the pot stock bubble of 2018 discussed above. Unlike that case, however, the problem here wasn't solely naivete about the relevant market. Traders in this case - mobilized largely on Reddit groups like r/WallStreetBets - explicitly defined the purpose of their market activity as undermining the market activity of hedge funds, particularly those that short sell.[60] It is worth briefly considering the ill-will these retail traders have towards 'Wall Street', however (in)accurately conceived. In many ways this is a story of populists (from the left and right) unifying against a common enemy in the financial system. On the one hand, there is a perception

[59] Trainer, "Saving Investors from Meme Stocks: Gamestop (GME)."

[60] In public discourse, short selling seems to be the target of particular ire. This is undoubtedly in-part due to it being more difficult to conceptualize than the logic of 'buying low and selling high' applied to going 'long' on a security. In common parlance, short selling is often misconstrued as "betting that a company will go bankrupt" or "shorting a stock into bankruptcy." In brief, it does neither. A sell-off in a particular security might provide information that convinces someone that they had overvalued it before, but, mechanically speaking, the act of short selling does not lower the price of a security. Selling shares might create temporary price dislocation (when there are more sellers than buyers, or a large increase in the number of shares being sold the price usually goes down) but these effects are usually small, and are never enough for a short seller to make money (i.e. there is no profitable trade in which a short seller would initiate a short to profit off fulfilling the basic mechanisms of the short). The other 'costs' to shorting - funding costs and the price they pay each day to short that security - ensure that attempting to 'panic' other traders into abandoning a stock will be unprofitable.

that the market, and more broadly American society, is stacked against them. On the other hand, there is a desire to 'get in on the action'. Among Reddit traders, for example, there is a sentiment that if hedge funds can use the market as a casino then so should they be able to use it in the same way.[61] Whatever one thinks about the populist case, the market actions spearheaded by r/WallStreetBets around stocks like GameStop are unlikely to yield any positive financial impacts for the typical 'little guy'. Further, trades that focus on punishing hedge funds aren't likely to send price signals that are useful for the capital allocation purposes of the market.

In the case of the pot stock bubble of 2018, retail investors were so adamantly enthusiastic about the legalization of marajuana in many states and Canada that the sector as a whole was vastly inflated. This phenomenon is quite different from the meme stocks like Gamestop that have increased in value for reasons unrelated to the financial fundamentals of the security, its business model, or even the whole sector. During the pot stock bubble, some inexperienced investors simply saw legalization has a reason for the entire sector to be profitable. Hedge funds and other professionals could continually make money on the bad trades of those on the buying side of the pot stock frenzy, knowing that retail investors were likely to be on the other side of these losing trades. On Reddit forums like r/WallStreetBets where meme stocks are championed, users actively encourage and embrace ignorance and losing money. Forum posts are just as likely to be posts about losing sums of money on single name stocks as they are screenshots of large gains. Users explicitly delight in how uninformed their investment decisions are. This strongly suggests that such traders are not helping the market allocate resources effectively, but rather providing an 'attractive nuisance' for professional traders.

My concern is not only that a disservice is being done to (unwittingly ignorant) retail traders by the technology that enables and encourages their behavior and by the institutional

[61] Zweig, "Robinhood Trader's Battle Cry: It's All Just a Game to Me."

traders that profit off them. I am also concerned that this behavior undermines the resource-allocation point of the financial system. Instead of using institutional and intellectual resources to determine, say, which company is best positioned to accelerate the transition to self-driving cars, analysts are modelling which buying patterns of retail trades correlate with the largest one day swings in volatility. Professional traders compete to be the first in line to profit from Robinhood users' losing trade ideas. That doesn't help the allocative aim of financial markets and wastes human resources that theoretically might otherwise provide some form of socially beneficial outcome.

Even a charitable interpretation of Robinhood's intentions would say that in attempting to further democratize trading, it has manipulated the structure of the market to incentivize the wrong (unproductive) kinds of behaviors. There are three types of corruption outlined by Debra Satz that we can use to understand harmful actions and structures in a market: *individual*, *institutional*, and *intrinsic* (i.e., in a commodity itself). The market for order flow incorporates the selling of information that is intrinsically corrupt. This trader information is itself creating trade ideas for hedge funds completely apart from any fundamentals of the corporations involved. The selling of user data from retail traders systematically limits the degree to which retail traders can be successful.

In some sense we excuse this predatory system when it comes to casinos or other entertainment betting activities because they are regarded as simply that - fun, frivolous, etc. To regulate such activity might be seen to be infringing on an individual's liberty to spend the fruits of their labor. I am not asserting that money needs to be spent productively. Consumption expenditures - for entertainment, say - are no less legitimate than investment expenditures. However, we should be troubled when the *stock market* is functioning as a vehicle for

entertainment and as a 'honey pot' for unsuspecting aspiring investors. Individuals betting at a poker table know they're gambling at a casino, millennials trading leveraged ETF funds might sincerely believe they're making intelligent investments for the future.[62] There seems to be an unacceptable difference in what retail investors think they're doing and what the system sees them as participating in. Further, it doesn't help if retail investors see themselves as gamblers. A casino does not claim (and is not seen) to efficiently allocate capital resources. It's well known that the casino owners provide thrills and do so by beating gamblers (after exciting games). How else could they pay for the gilded poker tables and chandeliers? The stock market, however, has a *telos* - it is a key engine in the economic machine. Financial markets have a job to do and, as we saw above, it is a mistake to distract them.

The problems with Robinhood-style retail trading isn't the fault of a set of corrupt players in the game. Financial markets ought to work - in terms of distributing capital - with each player acting in their own self-interest. The increasingly 'democratized' markets are untenable not merely because some individuals have bad outcomes (or even that a certain type of individual more frequently has bad outcomes) but because unproductive behavior is rewarded, which undermines resource allocation.

When justifying financial markets for their proposed ability to allocate resources, wealth creation is an essential motivating force. This is a serious problem for markets, however, because that also serves as a source of corruption. Harms to some investors can be tolerated in the market to the extent that they are a means to efficient and productive resource allocation. Conversely, poor outcomes for a certain set of players are not in themselves useful for the process of resource

[62] ETF - Exchange Traded Funds - are securities that bundle exposure to a broad-based index like the S&P 500 or Russell 200. Such instruments are usually less volatile than trading in single name stocks, and therefore have a reputation of being safe investments for inexperienced traders. Leveraged ETF funds however, concentrate the gains or losses of that security based on the underlying movement of the index. A 3x leveraged ETF would have a $3 gain or loss based on a $1 price movement in the index. They are much less safe for inexperienced traders.

distribution so they need not be tolerated.

In the financial market ecosystem, each innovator, financier, and trader can imagine themself as a hero of the market - serving to "cater to investor interest," "democratize the market," or "provide liquidity." Of course, self-enrichment is an intended outcome of these behaviors, whether it is seen as a by-product or a concomitant goal. Satisfying investors, expanding the pool of market participants, and providing liquidity do seem like positive contributions that facilitate an efficient, appropriate distribution of capital. Undoubtedly, the current financial system performs each of these tasks to some degree. Individuals in these roles, and even the institutions themselves, are not on the whole bad actors. However, the reward mechanisms of the financial system do not align with our normative reflections on the stock market. As previously demonstrated, the market's ultimate purpose is to efficiently allocate capital, but this aim is easily undermined by unchecked intrinsic, individual, and systemic corruption on part of market institutions and participants. The concern, then, is what should be done when pursuit of market rewards (money) undermines the goal of sensible resource allocation.

Section 3. Solutions

Financial markets do their work of price discovery and capital allocation by pulling together information from the various perspectives of market traders. Proper democratization, by increasing the number of perspectives in the market, has the potential to improve the market's allocative efficiency. New traders with new information and new perspectives should always be welcome. Further, democratization of the stock market might be a novel solution to the nation's stark and ever-increasing inequality. If the rich are getting richer because of their ability to invest in stocks - with compound interest rates! - then perhaps an answer to poverty, in part, is to get more people to do the same. Of course, this 'solution' doesn't help anyone currently struggling to make ends meet. It doesn't make sense to forego rent or groceries to buy shares in an S&P 500 Index fund, much less to trade options. However, an individual saving for retirement by simply investing a portion of each paycheck - money for which they don't have an immediate need - in the financial markets could potentially increase their wealth over time. This assumes, of course, that new investors will do at least roughly as well as older investors. Alternatively, society might try to aid in the wealth redistribution project through other means. One idea with potential would be something like a universal basic income as a means of redistributing wealth. This would - in effect - alter the only-the-rich-can-get richer dynamic of the financial system. Some sort of attention to inequality would alleviate the financial realities that push individuals towards market behaviors that are riskier and so less concerned with resource allocation.

But the current push for democratization doesn't seem to allow poorer people to reap the benefits of market participation - quite the opposite. On the Robinhood model, new retail traders are treated as a source of income for institutional investors rather than as a source of information for resource allocation. Historically, large-scale retail trading hasn't been a problem since there

were gatekeeping measures like fees and portfolio minimums - implemented for other purposes - that had the effect of tamping down retail trader activity. Fees, for example, disincentivize retail traders from trading with much frequency.[63] With these measures disappearing, we now have an issue, one that requires a multi-faceted and well-thought-out solution.

Reinstating the old gatekeeping measures would be a possibility for blunting the harms of increased retail trading.[64] Doing so, however, would amount to abandoning democratization ambitions. More people in the stock market is not a problem, per se. It is only an issue when they are being fleeced - or they are making horrible decisions. Limiting certain advanced trades - derivatives, say - makes good sense. The inherent complexity of trading derivative instruments is made even more dangerous for naive retail traders (who aren't even aware of what they don't know) by the other self-selecting participants in the derivatives market, sophisticated professionals who have access to more information and training. Keeping certain inexperienced or ignorant traders out of certain markets resolves this issue.

Educating retail investors would also be beneficial, although it is unlikely to totally resolve the naive-trader issues. Most retail traders do not have the resources needed - time, effort, and money - to earn the same qualifications as institutional traders. Still, some type of licensing process for aspiring everyday traders might prove beneficial. There is already a serious and comprehensive system of licensing for institutional traders through FINRA. Traders working for institutional banks, hedge funds, mutual funds, etc. are all required to take multiple exams that once passed qualify them as 'Registered Broker Dealers'. The purpose of these exams and the material they test has evolved since their introduction in 1974, but - as discussed above - the

[63] If a profit-driven trader buys a share in a stock for $100 with a trading fee of $15, they would need the stock to appreciate more than $115 to make a profit. Without this transaction fee, a profit-driver trader could conceivably sell the share once it appreciates to be worth more than $100.01.

[64] Some market designers and analysts have suggested brokers or exchanges could further restrict trading times to be at the open or close of a trading day ensuring that retail traders only have orders executed at the most liquid times in a given trading day.

exams cover technical information about market mechanisms, products, economics and ethics.[65] In a similar fashion, retail traders would be responsible for earning a sort of entry permit, one that demonstrates a base level of knowledge about the financial system and stock market prior to engaging in any investing behavior. Retail trader permitting could be done through the same regulatory bodies as do institutional trading licensing (e.g., FINRA) or through market entities - exchanges or individual brokers. The latter seems unlikely to happen in the current environment since brokers are - implicitly - paid more to have more ignorant customers.

One might wonder why the foregoing proposals are focused on controlling retail traders - the victims! - rather than controlling institutional traders. But it is a mistake to think all retail traders are victims. Everyday folks creating Robinhood accounts as a way to use their weekly sports-betting budget during a sports-less pandemic could arguably be engaging in individual-level market corruption, either from ignorance or by ignoring the *telos* of the financial market. It is not of major concern that a few individuals are mistaken about the role of the market or their own abilities to make good investment decisions - we should not criticize the market on the grounds that there are simply losers amongst winners. The market's ability to tease out information useful for resource allocation (price determination) is a virtue that depends on various traders taking different positions. These mechanisms drive discovery of information useful in quantifying the value of a company and its associated assets. Such a schema naturally yields both traders that make money and lose money from a given position. The mere existence of people who lose money in financial markets doesn't show that they are victims.

A valid concern on tightening regulation is that further limiting savvy traders might quash some of the incentives for seeking out information - and broadly speaking make the

[65] FINRA. "Implementation and Amendment Dates of Qualification Examinations." Implementation and Amendment Dates of Qualification Exams. finra.org

market's resource allocative mechanism less efficient. The real worry in our case, however, is that the market is rewarding unproductive behaviors - specifically, the unproductive behavior of fleecing unsophisticated Robinhood-style traders. Institutional traders look for trades where they can make money, and in doing this they usually sniff out stupid trades, ones that often belong to Robinhood users or similar retail investors. To make certain that only unproductive behaviors are targeted, any regulatory changes ought to be implemented with precision. In this case the simplest path with the smallest likelihood of generating unintended consequences might be to regulate Robinhood-style traders - naive retail investors - themselves. Regulation of non-professionals in the market might prove most effective in both implementation and influence.

The most effective 'nudge' for preventing unproductive trading behavior would be to limit the actual apps that firms like Robinhood employ. Robinhood facilitates the gamification of markets and harms users by encouraging users to trade frequently, offering exotic financial instruments unlikely to be understood by their users, and undercutting their trades by selling trade data. Technology providers and exchanges - i.e. those in charge of market structure - might have the ability to impose or positively promote ethical behavior by changing the structure of their platform and eliminating metrics and features that promote gamification. Brokers and their associated user interfaces could be limited in ways to safeguard customers from excessive trading and educate their users on the mechanics of trading in general to safeguard them from making over-leveraged trades. This regulatory change would be conceptually similar to the warning labels required to be prominently displayed on packaged cigarettes.

In many instances, however, these ethically-strengthening changes might negatively impact their bottom line. Perhaps some entrepreneurial firm or exchange could monetize the

safety advantages of such a permitting scheme. This would amount to giving up one revenue stream - selling out your investors - for another - protecting them. There might also be some additional inspiration to be gleaned from proposed solutions in response to discussions around ethical data collection. For businesses like Facebook and Instagram that currently offer a 'free' service to customers in exchange for access to data collection and advertising audiences, one proposed solution has been for those same companies to offer paid versions of their services that do not engage in such data collection.

The allocative mechanisms of the markets are harmed by the secondary market of data about Robinhood trades themselves. This is perpetuated by third-party companies like Robintrack packaging and reselling that data. This particular harm could be mitigated by regulating the selling of users' data and instituting ethical guidelines on the use of non-fundamental data for trading purposes. Attempts to dissuade people from choosing unethical actions, especially in market situations, are often more successful when they make an unethical profitable behavior simply unprofitable rather than illegal. When there is a lot of money at stake, people try to *evade* the rules that limit them if not outright violate them. Further, there is a self-selecting set of individuals who conform to the stereotypes of financiers portrayed in the media. The prototypical Wall Street film usually includes characters with questionable morals in work environments that more closely resemble a bacchanal than a legitimate corporate workplace. These stereotypes are unlikely to change as long as Hollywood finds Wall Street fascinating. Financial firms could rethink their recruiting practices to change their corporate cultures and implement reworked ethics training that aims to counteract the negative cognitive effects of business framing. Another less costly solution on the retail trader side could be the implementation of 'framing' devices on part of traders. Although this does nothing to ameliorate

the (often) harmful practices of allowing inexperienced retail traders to make complicated options trades, it might at least direct their attention to the capital-allocation purpose, a direction that might incentivize research about firms rather than treating securities as chips at a casino.

Other market participants are also susceptible to the negative consequences of our cognitive pitfalls. Professionals in the industry are also guilty of often harmful effects of tunnel vision on making a profit. In other professions, the risks of tunnel vision are in some way intrinsically deterred on the job - either by structural 'speed bumps' that have been put in place or by the nature of the job. Doctors are professionals that have the potential to have tunnel vision in regard to profit or solving a patient's case. The tunnel vision they are prone to experience is inherently reduced by the routine of the job: Doctors spend time with their patients, their patients' families, and are forced to have some minimal form of human interaction. This interaction makes it more difficult for them to forget or block out the ultimate purpose of their profession. In finance, there are no 'speed bumps' for traders susceptible to tunnel vision. Productive regulation would put in place a similar style of 'speed bump' for professional traders and remind professionals doing investment research of their role in the broader project of efficient resource allocation.

Regulation of the finance industry can be enforced but it often generates counterproductive incentives for industry players to find loopholes. There is often a cycle of regulation and innovation around such regulations. This is unlikely to change as long as there are rewards for this kind of behavior. On the other hand, institutional traders are really good at finding ways to make profit when regulation changes. Future research will be needed to discover the most optimal solution to the issue discussed in this paper. Well functioning markets rely on both adherence to rules and the intelligent design of them. Market designers are needed to find

the best regulatory structure to achieve the desired end - that market participants can engage in the efficient allocation of capital with minimal disruption. Market design theorists understand that the failure or success of certain institutions depends on very particular facts about how they work at the transaction level. The hope is that, with careful attention, undesirable outcomes or inefficiencies of a market can be addressed by carefully constructing and articulating rules of engagement. These rules ought to deter actors from behavior that creates troublesome effects without damaging the incentives that motivate productive action. In the context of financial markets, recall the CME to NYSE arbitrage issue from before. Traders engaged in an expensive race to see who could get information first. Arbitrage, of course, can be a noble pursuit in the effort of efficient capital allocation. In certain circumstances however, it can undermine that goal. Although firms were working to arbitrage the speed of communication between exchanges, the amount of speed they gained was so infinitesimally small as to be beyond human perception. The transition to electronic trading at the turn on the millennium indeed produced documented increases in price efficiency, but the war waged by high frequency trading firms has thus far been a very expensive race with no perceptible gains to market efficiency. The efforts of high frequency trading firms to establish the shortest possible amount of time to send data over a fiber-optic cable is unnecessarily wasteful arbitrage. The focus in this paper has been on traders doing capital allocation work and signaling their results by prices. It would be better if a smaller percentage of market participants were investing without doing information work and so posing a diversion for other traders. Allowing Robinhood traders to do it all is like feeding bread to ducks - institutional traders love it, but it's not what they should be 'eating'. The market design goal is to come up with a set of rules that allow people to trade as they have funds of information but not as a game or form of entertainment. This sort of outcome will require some

serious thought.

As Al Roth notes, while good market design can evolve over time, bad market design can persist indefinitely. The analogy he uses is that of humans and walking: Although humans evolved to walk (good design) but have back problems and flat feet (persistent non-ideal design). Good design can also be stifled by institutions and individuals benefiting from the status quo. One must understand the rules a given market needs to understand how markets should operate and be governed. Well functioning markets can be delicate to create, and can be hindered by regulations that are too slow, too rapid, too pervasive, or too loose. The expertise of market designers in economics will be necessary to intelligently address normative issues in financial markets without creating loopholes to be circumvented by industrious institutional traders

Section 4. Conclusion

Contemporary moral philosophy often criticises markets on the grounds that they can and do produce harmful outcomes and hinder agency. My criticism, on the other hand, uses the telos of financial markets itself to establish that recent attempts to democratize the market are self-undermining: they both expose new entrants to the market to harm and distract the market insiders from their usual tasks.

If the goal of the market is to efficiently allocate resources to companies in order to facilitate production and innovation, time and money spent on taking advantage of other would-be investors undermines that purpose. In this sense Robinhood hinders the both the outcomes of their users and the allocative mechanisms of the market itself - it proclaims to be fixing a problem in the market while actually creating another one. In its efforts to give more potential participants in the market agency, it has created a market for trading data making financial markets worse off than they were without their technology.

The three main players in this untenable dynamic are the institutional traders, technology providers, and retail traders, but the financial markets are interconnected between so many individuals and institutions, making it difficult to isolate change in one particular area. Changing the behaviors of institutional traders is difficult, if not impossible, without changing the structures in which they act. Altering the technology providers give access to is difficult to the extent that it hurts profitability. More everyday people are downloading apps to trade stocks in their free time, evidence of an interest in getting involved in finance. But in the pursuit of a further democratized stock market, and ultimately a more equitable society, we should be sure not to cast away all restrictions on a market that is in no way genial to newcomers.

In a time when the stock market seems to be dislocated from the experiences and

sufferings of everyday individuals in a way that hasn't been true of previous recessions, it is worth criticizing financial markets normatively to find better ways for them to contribute to socially optimizing outcomes. Recent failures at democratizing financial markets will require in part, paternalistic solutions to prevent individuals from losing wealth as they're attempting to create it. It is becoming increasingly important, then, that market designers assist in creating positive solutions to curtail harmful retail trading behaviors. Although Robinhood's self-proclaimed motives are to democratize finance for all, the unethical treatment of their users portends that perhaps Robinhood is but a false idol.

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