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The relationship between
retail investor behavior, information
and commission rates in stock markets

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1 Introduction

Retail investor behavior has been evolving over the last 50 years. Two reasons for this are the changing commissions regarding stock market trading and the increasing information available to them. We have now entered an age where commissions are often non-existent, and more information is available for the average person than ever before. If household investors were fully rational, these changes would lead to higher net returns for them. As we will see, retail traders are far from rational; a number of heuristics can be examined when looking at their behavior. To see how the commission rates and the available amount of information influence their performance, this paper will look at different periods with different circumstances and how investors reacted to their current situations. The paper will mainly look at the stock markets of the United States of America. In the first section, I will look at the most prominent behavioral phenomena and the relevant literature regarding them. In the second section, I will look at the evolving situations regarding stock markets and how investor behavior has changed. The third section looks at the current situation in detail, focusing on zero-commission brokerages and their effects. The fourth section concludes the findings and presents possible policies aimed to increase retail investor welfare.

2 Investor behavior

The following section will give a thorough overview of the known behavioral phenomena. It will describe the relationship between deviations from rational thinking and investor performance. It will also provide examples from the world of investing for the different behavioral aspects.

2.1 Heuristics

Heuristics are mental shortcuts automatically used by individuals to make decisions quickly. While they are helpful for their purpose, they often do not lead to a rational outcome. This section will describe a number of them and provide examples related to investment behavior. Perhaps the most influential paper related to heuristics is Tversky and Kahneman's 1974 work, "Judgment under Uncertainty: Heuristics and Biases". It provides some of the most important heuristics of behavioral economics, which we will often see later when looking at retail investor behavior. These are representativeness, availability, and adjustment and anchoring.

2.1.1 *Representativeness heuristic*

The representativeness heuristic allows us to make decisions quickly under uncertainty. When individuals have to estimate the probability of an event quickly, they compare it to related situations already known to them. An example of this may be an otherwise average company that has had an exceptional performance in the past. When an investor who has no in-depth knowledge of the company is asked to value it, he may use representativeness bias and believe that the company is above average (Boussaidi, 2013).

There are multiple reasons why the heuristic may result in an incorrectly guessed probability. Individuals are shown to be insensitive to both base-rate and sample-size (Tversky and Kahneman, 1974). Base-rate fallacy in investing is often demonstrated; people are overreacting to new information compared to prior knowledge. This is the basis of overreaction (De Bondt and Thaler, 1985). For the previous example, sample-size neglect can

be a factor when comparing older companies with newer ones *ceteris paribus*. If they have the same probability of having an exceptional quarter, those who have been participating for a longer time will, on average, have more of such events. Individuals may not consider this fact; therefore, they may believe that an older company is better, as it had more successive quarters. Tversky and Kahneman (1974) also goes into detail explaining the misconception of chance. Recent events can influence how individuals perceive probabilities (gambler's fallacy, hot hand bias, regression toward the mean). For example, when a company reports an unexpected exceptional quarter, investors might try to find a reason to explain it. This way, they overvalue the company, but it can easily be the case that due to regression toward the mean, the company will go back to its expected growth rate in the future.

2.1.2 *Availability heuristic*

The second heuristic described in Tversky and Kahneman (1974) is the availability heuristic. Its basis is that people do not use all the information available to them equally but instead overweight more recent and more personal information. It is closely related to confirmation bias and overconfidence. It affects the estimate of the probability of an outcome based on how easy that outcome is to imagine for the individual.

Kliger and Kudryavtsev (2010) looks at a specific case in investing: analyst recommendation revisions. Such reviews signal a change of consensus, and investors may use them as information to act upon. The paper documents that the availability heuristic is present, meaning people value such readily available, recent information. They concluded that both stock-specific characteristics and market events determine the level of bias. Stocks with smaller capitalization and higher associated risk reacted more sensitively to analyst upgrades and downgrades, which the authors explained with a reduced amount of information on such stocks. They also found that on days when stock market moves were substantial, analyst recommendation upgrades were less determinant, while downgrades had a more significant effect.

2.1.3 Adjustment and Anchoring

The final section of Tversky and Kahneman (1974) is titled "Adjustment and Anchoring". In an estimation, an anchor is a benchmark, usually a number, which people have as an initial idea. They know that the anchor is not close to what the exact estimate should be, so they adjust; however, researchers find that often this adjustment is less than optimal. Investors often use anchors and reference points. Their expected return or the target price for a stock can all be anchors. When their estimates fail, they might not make an adjustment independent of the previous anchor; therefore, they could end up with a biased new estimate.

The three listed heuristics have been shown to have an effect on investor decision making (Khan et al., 2017). There are many others, for example, affect effort and scarcity heuristics, that can also be interested in analyzing in relation to retail investor behavior.

2.2 Prospect theory

Perhaps the most vital work to review for any overview of behavioral economics is Kahneman and Tversky's "Prospect Theory: An Analysis of Decision under Risk" (1979). The paper's primary purpose is to show that the expected utility theory does not accurately describe human behavior. Instead of a utility function, it offers an asymmetric value function. It proposes that individuals are reference-dependent; that is, people judge outcomes based on a status quo. In the model, people view outcomes as gains or losses rather than final states of welfare. The probabilities of expected utility are replaced by decision weights. Prospect theory distinguishes two phases in the choice process: an early phase of editing and a subsequent evaluation phase. In the first phase, individuals analyze the offered prospects, often with biases, to translate them into values. These values are often faulty, therefore, in the second period, the evaluation phase, they will not pick the highest rational value, but the highest value subjective to their process.

The paper also highlights two phenomena: the certainty effect and the isolation effect. The certainty effect shows that in contrast to expected utility theory, people overweight certain outcomes when compared to probable, but uncertain outcomes. This can be seen when comparing younger and older investors: while they act similarly between two risky

assets, when comparing a risky and a certain outcome, older participants are more risk-averse, and they will pick the certain outcome at a disproportionately high rate (Mather et al., 2012). The isolation effect describes behavior where people are faced with choices that share some aspects. Individuals tend to focus on the parts that distinguish these choices. This can lead to inconsistent outcomes, as they can distinguish them in multiple ways.

2.3 Cumulative prospect theory

In their 1992 work, "Advances in Prospect Theory: Cumulative Representation of Uncertainty", Tversky and Kahneman rework their previous model by changing the decision weights from separable to cumulative. The model builds upon five effects. The first is the framing effect, which shows that despite facing the same choices, individuals answer differently when the choices are presented in a different form (Tversky and Kahneman, 1986). The second is nonlinear preferences, which means that the same amount of differences between two probabilities (for example, the probabilities of 0.99 and 1.00, compared to 0.10 and 0.11) can have different impacts on preferences (Camerer and Ho, 1994). The third is source dependence, which looks at an individual's attitude to uncertainty as a factor of their sources. The phenomenon explains that people are more likely to participate in bets regarding their area of incompetence, despite the identical amounts of uncertainty. This can be seen in the stock markets as well, where investors may prematurely invest disproportionately more in their areas of competencies, not considering the different amounts of uncertainty (Nettayanun, 2017). The last two effects will be explored in more detail in the paper; these are risk-seeking and loss aversion.

2.4 Endowment effect, Loss aversion, Disposition effect

For rational agents in rational markets, buying and selling assets are theoretically the same mechanisms. For example, in an unrestricted market, investors can engage in short selling, resulting in the same effect as if they were selling assets they own. The price at which they would buy a stock, therefore, should equal the price they would sell the same stock for. This

is not how retail traders behave in real life. Part of this can be explained by realistic markets, which, for example, do not allow short selling exactly the same way as buying assets. Controlling for this, we can still observe behavioral biases about how household investors hold their assets.

2.4.1 Endowment effect

The endowment effect can be seen for countless personal items of people. It is the phenomenon that people are willing to depart from a possession that they own for a larger value than they would spend on acquiring the same item (Kahneman et al., 1991). Emotional attachments can partially explain this. If this was the complete case, we could argue that stocks are not subject to the endowment effect, as they generally have low, often zero emotional values attached to them. Contrary to this, Macedo et al. (2007) shows in an experimental setting that individuals possessing stocks are subject to the endowment effect. They simulated an investing scenario for a large group of students, where they received initial endowments of stocks and real estate randomly. The experiment went on for 21 rounds, where participants could see what would happen in the future. If they were behaving rationally, they could therefore see how they could maximize their worth. While they did take the available information into consideration, groups that held a higher rate of stocks or a higher rate of real estate than optimal in the beginning kept their initial endowments even after a large number of rounds.

Furche and Johnstone (2006) shows in trading data that the endowment effect is existent in stock markets as well. Even when individuals exchange their assets frequently, hence not having an emotional attachment to them, they still trade them with bias. On average, they exhibited that on the Australian Stock Exchange, the ask prices (what people are willing to sell their assets) are systematically further from the market price than bid prices (what people are willing to pay). They also found that this is not homogeneous across trade size and trade platforms. Larger orders and institutional trades were less subject to the effect compared to smaller trades and retail investors, who might be more subject to the endowment effect.

2.4.2 Loss aversion

Loss aversion was first described in Kahneman and Tversky (1979). It is the phenomenon that individuals, as opposed to expected utility theorem, do not value gains the same as losses.

For its interpretation, a reference point is needed. They find that the value function is more realistically describing human behavior when it is concave for gains and convex for losses, as well as being steeper for losses. A rule of thumb for loss aversion is the loss aversion coefficient. If someone perceives the loss of utility by the loss of a given amount to be twice as high as the gain of utility would be for the same amount, his loss aversion coefficient is 2. This value is shown to be different in different research. For example, Tversky and Kahneman (1992) sets the coefficient to be 2.25, which is the baseline for further research. Abdellaoui et al. (2008) shows that while the values have a relatively high variance, the general tendency that it is a number higher than 1 (that is, losses weight more than gains) stands.

Loss aversion has been thoroughly explored in the field of investing. It is often attributed as one of the leading causes of investor underperformance. Hwang and Satchell (2010) finds that it is more significant in financial markets than in Tversky and Kahneman (1992). They analyze pension funds in the UK and the USA, and found that the portion of equities in US funds are smaller, which could indicate that there is a different amount of loss aversion in the two markets. They concluded that for their US sample, the loss aversion coefficient is 3.25 on average, while it is 2.75 in the UK. They noted that this is subject to fluctuations regarding market conditions. During a bull run, for example, individuals were shown to be more loss averse, which could be because they were undervaluing gains at such times. Loss aversion is shown to not only have an effect on individual performance, but on the companies they invest in as well (Bouteska and Regaieg, 2020).

Coval and Shumway (2005) looked at loss aversion for a specific subcategory of investors: day traders. They distinguish this group into two sections: loss averse traders and informed traders. They find that those who lose money in the morning will be more risk-seeking in the afternoon, compared to those who gained in the morning. This risk exceeds what would be necessary if they were rational, this is because of loss aversion: traders are looking to negate the loss of utility, which, according to prospect theory can only be done by a larger amount of gains that they lost. While Coval and Shumway (2005) finds that day traders are loss averse, they also note that their change of behavior is quickly offset, therefore this bias does not have an effect on markets in their research.

2.4.3 *Disposition effect*

The disposition effect was first introduced in Shefrin and Statman (1985). It builds on Kahneman and Tversky (1979)'s prospect theory, specifically loss aversion. Their theory imposes that participants in financial markets behave with a general disposition to sell their losing assets too soon and to realize their gains too early compared to rational behavior. For comparison, they used Constantinides (1983)'s theory on optimal liquidation. It suggests that capital tax minimization should be the investor's objective, therefore gains should be held for as long as possible, while losses should be realized immediately. Due to transaction costs, this is not a realistic strategy, but Shefrin and Statman show that it is indeed the case that investors are aware of tax implications when liquidating their assets. Specifically, in December investors sell an especially low number of stocks which increased during the year, while selling a high rate of losers to maximize their tax benefits for the given year (Dyl, 1977). Shefrin and Statman developed a rational model based on this, and compared empirical results, concluding that the disposition effect indeed exists, as optimal liquidation did not explain why investors held losers for too long and winners for too short. While their analysis was not conclusive, the effect has been shown in multiple empirical researches.

Odean (1998a) looked at a larger sample for a 6-year period. He found the disposition effect to be relevant both for the market price and especially for individual investors' returns. Following Kahneman and Tversky (1979), both Shefrin and Statman and Odean based their researches on reference points, which they picked to be the prices that investors paid for their assets. Heath et al. (1999) looked at data where employees received call options for their companies. This way, there was no purchase price. Instead, they found that employees used reference points based on the highest price of the asset in the past year. Their research was also different in that exercising options irrationally is more costly than with stocks. They showed that generally it is best to wait until the expiration date, but argued that in this example, there may be rationales for exercising earlier, for example lower risk tolerance or the need to liquidate. Their conclusion was that when controlling for these, psychological factors were needed to explain the outcome, and that the disposition effect was still relevant when there is no reference point: employees prematurely exercised their options, while in cases

where the price dropped, they were reluctant to sell their assets.

2.5 Overconfidence

In 2008, Warren Buffet infamously proposed a bet to hedge fund managers, which was accepted by Protégé Partners LLC's Ted Seides. The bet was simple: the hedge fund would have to outperform the SP 500 index in a 10 year period, after commissions. Despite having extensive research tools and human capital available, the fund was unable to win the bet. Why is it then that despite the fact that some of the most well-equipped companies are unable to beat the market, millions of individuals believe that they can? The answer is perhaps the most important bias regarding retail investors, overconfidence. It is the bias that people think they can achieve better results and predict events more accurately than they actually can.

2.5.1 *Overconfident behavior*

Odean (1998b) goes into detail to see how different groups (price-taking traders, strategic-trading insiders, and risk-averse market makers) affect markets when behaving overconfidently. For our purpose, price-takers are the most interesting to examine. Odean shows that when they do not act rationally, they hurt both their returns and decrease social benefits. His model compares passive, rational investors with otherwise rational but overconfident traders.

Overconfident traders value information more and therefore spend more on acquiring it than they benefit from it. Odean also shows how the interpretation of information is irrational. Abstract information, which is harder to interpret, is valued lower; therefore, in overconfident markets, company earnings, which possess a large amount of information, but which are difficult to analyze, have a lower effect than what they would in a rational market. On the other hand, news that has no rational value but is presented in a way to grab attention will have a more significant effect than what it should based on the information it presents. Overconfident investors also trade more, which is shown to decrease returns (Barber and Odean, 2000) and increase market volatility. Odean (1998b) concludes that overconfident price-takers may achieve superior returns compared to their passive peers, but this is because

of the irrationally high risk that they take on. They hold underdiversified portfolios, as they believe that they are capable of picking assets with higher returns. Therefore, as the model proposes that they act rationally in risk-taking, their expected utility decreases despite the higher profits.

While Odean (1998b) examined overconfidence as the overestimation of accuracy by investors, Graham et al. (2009) looks at the "better-than-average" effect. They hypothesize that excessive trading not only comes from investors' perception of information, but because they are more likely to act on their beliefs due to overconfidence. They looked at retail investors' perceived competence on two outcomes: trading frequency and home bias. Consistent with previous findings, the more competent an individual thought of themselves, the more often they traded. Home bias is the fact that investors hold a disproportionately high amount of asset from their country. When traders were more overconfident, Graham et al. found that they were more invested in international stocks, reducing home bias.

While the general tendency for retail investors is that they are overconfident, it is important to note that this overconfidence is not homogeneous across all household investors. Age (Mather et al., 2012), gender (Barber and Odean, 2001) and place of birth (Yates et al., 1988) can all have effects on investor behavior. We have already seen that older investors tend to be more risk-averse (Mather et al., 2012). This aversion does not come in the form of probability, instead, it relates to the certainty effect. This can explain why older people disproportionately prefer risk-free assets, such as bonds, compared to low-risk stocks. Barber and Odean (2001) looks at a sample of 35,000 household investors and hypothesizes that based on psychological theory, the investing behavior of men and women will be different. They confirm this hypothesis and show that even women, who were hypothesized to be less overconfident, achieve returns below market averages, but they only reduce their returns by 1.72% annually, while men's returns are 2.65% less than the benchmark. This effect is more profound in single individuals, where men underperform women by 1.44%. The authors explain this with excessive trading that is subject to overconfidence. Hwang and Satchell (2010) showed how there is a small difference between the loss aversion coefficient of the US and UK-based investors. Yates et al. (1988) shows that this effect is much more profound in Taiwan. The 75% annual turnover rate that was executed by retail investors in the USA during

the examined period was significantly lower than the almost 300% rate on the Taiwan Stock Exchange. Part of this large difference was explained by the fact that during the analyzed period, gambling was illegal in Taiwan, meaning that people wishing to bet had to resort to betting on stocks. The authors believe, however, that even without this phenomenon, a different level of overconfidence can be explained by cultural differences.

2.5.2 *Overreaction*

People react to new information. To find what the appropriate reaction should be, Bayes' rule is used. Experimental psychologists, however, found that new information is weighted more compared to previous information than Bayes' rule suggests. This phenomenon is called overreaction. De Bondt and Thaler (1985) were interested to see if overreaction affects stock markets. Their hypothesis is that if stocks' prices reacted rationally to new information, their prices will, on average, not experience excess returns (negative or positive). However, if overreaction is existent in stock markets, stocks which reacted overly negatively in the past will have excess positive returns as the overreaction fades, while previous "winners" will perform under market average. To test their hypothesis, they looked at 5 year intervals between 1926 and 1982, and how stocks which were deemed "losers" and "winners", based on their past, unjustified, performances. Their analysis confirms that previous losers will significantly outperform winners, showing that overconfidence existed during this period. This paper serves as one of the first critiques of the efficient market hypothesis, in which investors are expected to act completely rationally.

2.5.3 *Changes in overconfidence, self-assessment bias*

In the previously analyzed works (De Long et al. (1990), Odean (1998b)) the actors were behaving statically. This can be explained by what they wanted to examine in their models. Still, individuals' behaviours, like overconfidence, may change during their lifetimes. Gervais and Odean (2001) examines this in a multi-period model. They hypothesize that an investor's overconfidence will change based on his previous returns. If recently his portfolio's value increased, it may cause him to be more overconfident and vice versa. This phenomenon has been shown in other psychological experiments outside of financial markets. Indeed, as stock

markets generally increase in value, investors will falsely believe that the increase of their portfolios' values is due to their abilities, rather than an overall economic growth (forrás, odean?) To see if their hypothesis is correct, they build their model on Statman et al. (2006)'s earlier model, which proves that as prices increase, overconfidence increases, and as a result, volatilities will be higher. This increase in volatility then decreases investors' expected returns (Barber and Odean, 2000). Their model, in line with empirical data, predicts that overconfidence will be highest for individual soon after they start participating in stock markets, and as they get older, they will be able to more accurately assess their abilities.

2.6 Irrational agents in efficient markets

2.6.1 Mapping

Experimental economists were criticized in the beginning of their research for multiple reasons. One of the reasons is that because of competitiveness and arbitrage, it can be said that markets are rational (if they weren't, arbitrageurs would enter the market and profit from the irrationality, moving the market to the equilibrium). Russell and Thaler (1985) sets up a model which goes against this. The authors create mapping functions, which look at whether individuals made a rational or irrational choice based on the information available to them and on their utility functions. Based on their choices (their mapping functions), they categorized individuals as either rational or quasi-rational. If markets can reach efficiency with both rational and quasi-rational individuals, it means that the equilibrium state is not a perfectly rational one. They showed that for markets with limited actions (such as no short selling) arbitrageurs can make the market more efficient at the cost of quasi-rational agents. However, when allowing for the characteristics that financial markets have, they proved that the market can be at equilibrium with both rational and quasi-rational participants, leaving no room for arbitrageurs to exploit.

2.6.2 Arbitrage

Efficient markets demand that in the long run there is no room for irrationality. Investors who behave sub-optimally would lose their money and leave the market. We can see that this is not the case, even when individual traders act visibly irrationally. Shleifer and Vishny (1997) explains why this is the case. In efficient market models, arbitrageurs play a large role, by exploiting the mistakes of fallacious for their gain they help achieving a more rational state. In theory, they can do this at low costs, meaning that there is no barrier to their existence. These basic models, however, do not calculate with exceptionally large volatilities, which is the case when there is a large number of irrational investors (Odean, 1999). As such, the model proposed by Shleifer and Vishny shows that while situations with high volatility offer larger possible returns, arbitrageurs will avoid such situations as the risk associated with them is too high. This means that irrational individual investors will not lose as much of their wealth as they would in a completely efficient market, and they can stay in the market for a longer duration.

2.6.3 Noise traders

Retail investors are often said to be noise traders. This is because of their relationship with the information available to them. Apart from overreacting, they also believe that the information available to them is worth more than it actually is. When they integrate the available information at a different value than it actually is into a stock's price, it may cause the price to be other than what it should be fundamentally. Earlier, this was thought to be unimportant. Because there is a difference between a stock's price and its fundamental value, rational investors can use this as an arbitrage at the expense of noise traders, who, after losing their wealth, will stop trading, returning the asset's price to what it should be (Friedman, 1953).

De Long et al. (1990) argue that because of an additional risk factor, the "noise trade risk", this is not the case, and noise traders may be more profiting than sophisticated investors. The basis of their paper can be explained the following way: suppose a group of irrational investors buy a stock so much that its price significantly deters from its fundamental value. Arbitrageurs could short the stock, betting on its return to the original price in the near future. However, they face a new type of risk. Because of noise traders, it can not be said with certainty when

the price will decrease, which may cause problems for rational agents who need to liquidate their assets at some point in the future. Because of this uncertainty, De Long et al. proposes that sophisticated investors will not counter the effect completely; therefore, the equilibrium price will be higher than the fundamental price, leading to noise traders profiting from the scenario. The proposed model and the main conclusions fit into the examined phenomena of the behaviors of rational and irrational traders. While the average return of noise traders may be above that of sophisticated investors, individual profits have a significant variance, meaning that while some of them have large gains, many of the noise traders underperform their peers. The model also looks at the duration of the process and finds that the longer the time horizon is, the more arbitrageurs will be able to exploit the situation, meaning that noise traders will benefit from short-term strategies more.

3 The history of retail investors

Up until recent decades, active stock market investment was not plausible for most people living in the United States of America. The 1792 Buttonwood Agreement set rules for brokers about a required minimum commission. This rule would not be abolished for almost 200 years. This meant that due to the economics of scale, larger institutions and those with larger sums to invest would be at an advantage compared to smaller investors, who would have to sacrifice a higher percentage of their wealth for commissions. On May 1, 1975, this changed, when the Securities and Exchange Commission deregulated fees, allowing for competitive rates to be set. This date is now known as May Day.

3.1 Investing environment in the USA before 1975

In retrospect, the changed laws in 1975 had lasting effects on both household and institutional investors. To analyze these changes, we need a baseline model, a description of the environment before the changes. Schlarbaum et al. (1978) is one of the first researches done regarding household investor performance. The investigated period was between 1964 and 1970, prior to May Day. They examined a representative sample of individual investors and found information about their returns and commissions. While positions held for a long time (over 180 days) performed similarly to the benchmark performance (the market return), they found that positions held for less than 30 days substantially outperformed the market. They did not provide conclusive answers on why this was the case, only hypotheses. For short-term investors, they explained that they could exploit momentary disequilibria without influencing prices, which they could profit from after the anomaly was balanced. They explained why long-term investors could not outperform the market with a behavioral economics phenomenon that was not yet explored during their time. They hypothesized that positions that increased in value were sold too soon, while losing positions were held for too long, resulting in inferior returns. They also indulged in looking at commissions paid by different groups and found that for positions held for over a year, commissions accounted for 26% of

returns; for round trip trades conducted in less than a month, it was 63%. We can see that this is a substantial part of the invested amount, and it will be interesting to see how these amounts change for individual investors with different behaviors. While the research serves as a good overview of the 1960s, we need to account for pitfalls. Schlarbaum et al. looked at the risk profile of household investors compared to the market, but they did not categorize risk for positions of different lengths. This might be problematic if short-term positions were more volatile, as this could account for their higher returns. Still, the paper stands as a good baseline to compare commissions after 1975.

Lewellen, W. G. and Lease, R. C. and Schlarbaum, G. G. (1977) went a step further in their investigation. Their research was the first one concerned with the characteristics of household investors as individuals. They used the same dataset as Schlarbaum et al. (1978), and extended it with a questionnaire for the population. This led to an in-depth list of variables for a large number of retail investors, including their descriptive statistics, such as age, income and sex; their transactions in the examined period; and their perceptions of their investing behaviors. The paper predicted investing patterns based on the individuals' characteristics and answers to the questionnaire, and found that it lines up with the actual transactions made by them. They found that younger investors have a larger tolerance for risk, while older people were more conservative in their portfolio selection. The paper also looked at how the beliefs of individuals regarding risk and investment time horizon affected their behavior. Those who found short-term returns to be more important engaged in both more frequent tradings, and were more likely to use tools such as margins, options, and short-sales. They also found a correlation between those who are more active traders, and those who believe that security prices can be predicted accurately. While the investing demography has changed over 50 years, Lewellen, W. G. and Lease, R. C. and Schlarbaum, G. G.'s conclusions can be used as a baseline to see how the behaviors described above changed over time. Baker et al. (1977) looks at retail investor preferences in the 1970s, and confirms empirically that they have strong preferences on portfolio selection ex ante. Risk seeking individuals were correlated with higher expected returns, lower amounts of dividend income, and larger capital appreciations.

3.2 May Day and its effects

The short-term effects of deregulation were different from the long-term ones. Because there were already competitive commissions in place for orders higher than \$300,000, the first benefactors were institutional investors. While they saw a drop from 25 cents per share to only 8 cents, retail investors actually saw an increase from 30 to 40 cents per share (Wayne, 1985). This was only a temporary situation, as market service providers reacted to the new competition. Brokerages before May Day were concerned with multiple purposes. They not only offered trade execution but also offered services such as providing information and recommendations. These services were costly to provide, but they were viable for wealthy customers. After May Day, brokerages that offered these features were known as full-service brokerages. However, as competitive rates were now not only concerning high-value investments, a new type of brokerage was introduced: discount brokerages. The first of such brokerages was Charles Schwab Co. The idea behind it was that they would only provide trade executions, and by abolishing other expensive services, they could offer this at a much cheaper rate. This meant that low-value individual investors could participate more actively in financial markets, albeit at the cost of giving up information. Discount brokerages had large interest from the beginning and the number of accounts quickly grew.

One of the first studies regarding May Day were conducted in 1975 and repeated in 1976 by the United States Securities and Exchange Commission (SEC, 1976). The reports find that there are significant changes in brokerage revenues and trading volume. Naturally, revenues decrease as commissions decrease. Trading volume increased during this period; however, according to the reports, volatility was not affected. This finding was not widespread, and the assumption that the increased volume led to increased volatility became prevalent in research and policy suggestions. One recommended government intervention based on this was the securities transaction tax. The idea behind it is to return to the scenario before May Day, except instead of setting minimum limits on commissions, trading taxes would be used to incentivize investors to trade less. If volatility were to decrease, this might increase investor surplus. Such tax was introduced in some countries, and it is still existent in India; however, currently, it is not used to decrease volatility but to stop the avoidance of capital gains taxes.

Opponents of the tax include Umlauf (1993), who showed that the transaction tax in Swedish markets is unnecessary, stating that while it decreases volume, it does not have a significant effect on volatility, as the two are not connected. Jones and Seguin (1997) base their work on the findings of Umlauf and the SEC report. They analyze the year before and after May Day on the NYSE, AMEX, and Nasdaq. They find, similarly to the SEC reports and to other research, that volume indeed increased. Volatilities on the exchanges moved in parallel before the change; however, the regulation only affected the NYSE and AMEX, not Nasdaq. This means that a difference in differences model can be used to examine the effect of May Day on volatility. Their finding is that the volatility of Nasdaq (which serves as the baseline) decreased between May 1975 and May 1976. From the relationship between the volatilities of the exchanges earlier, and the trend of the Nasdaq, decreasing volatility can be estimated for the NYSE and AMEX if there was no change in regulation. They compared this estimate with the hypothesis that if volatility were to increase, it would be caused by the increased volume caused by May Day. The result was that not only was there no increase in volatility, but it also decreased more than the estimated decrease. They concluded that the increased volume after May Day did not result in an increase in volatility, meaning that government interventions, such as the securities transaction tax, will not increase the surplus of investors.

Schenk (2020) describes what effect the deregulation had on global investments. On October 27, 1986, more than ten years after May Day, the fixed commissions set by the Stock Exchange Rule Book were abolished in the United Kingdom, which meant that the London Stock Exchange also saw similar developments to that of the NYSE. The author looked at the decade between the two deregulations and found that investors reacted to the lower costs despite being in a different country. The value of UK stocks traded fell by 80% compared to the value of US stocks traded. To see that this was not because of an unidentified cause, Schenk looked at the period after 1986 and saw that this value quickly rose after the fixed commissions were eliminated.

Important research conducted on household investments was done by Barber and Odean (2000). Their sample was of households at discount brokerages between 1991 and 1996. During this time, the costs associated with trading were higher still. The authors calculated an average of 1.52 percent for commissions and 0.5 percent for bid-ask spread. The cost of

information was also relatively higher than today. Barber and Odean distinguished full-service brokerages and discount brokerages, only focusing on the latter. Individual investors complement institutions by preferring stocks with smaller capitalization; during the analyzed period, these outperformed large stocks by 67 basis points, and the authors created the benchmark returns accordingly. Of the over 66,000 households examined, it was shown that the average household performed similarly to the benchmark market returns when looking at only gross returns. The net returns fell behind this by approximately 2 percent. This shortcoming is not homogeneous among households. Those who trade rarely perform at the expected level; however, those who are trading more frequently fall substantially behind. Overall, investors who traded frequently only realized net returns of 11.4% annually, while those who traded more infrequently achieved 18.5%. The authors credit this to two phenomena. First, the commission costs are inherently higher for a larger number of orders conducted. Second, they explained the higher number of trades with overconfident behavior. Individuals overvalued the information they possessed and traded more frequently. This led to inferior strategies, as well as higher commissions, with the ultimate result of lower returns.

3.3 The effect of the internet and lower costs on investor behavior

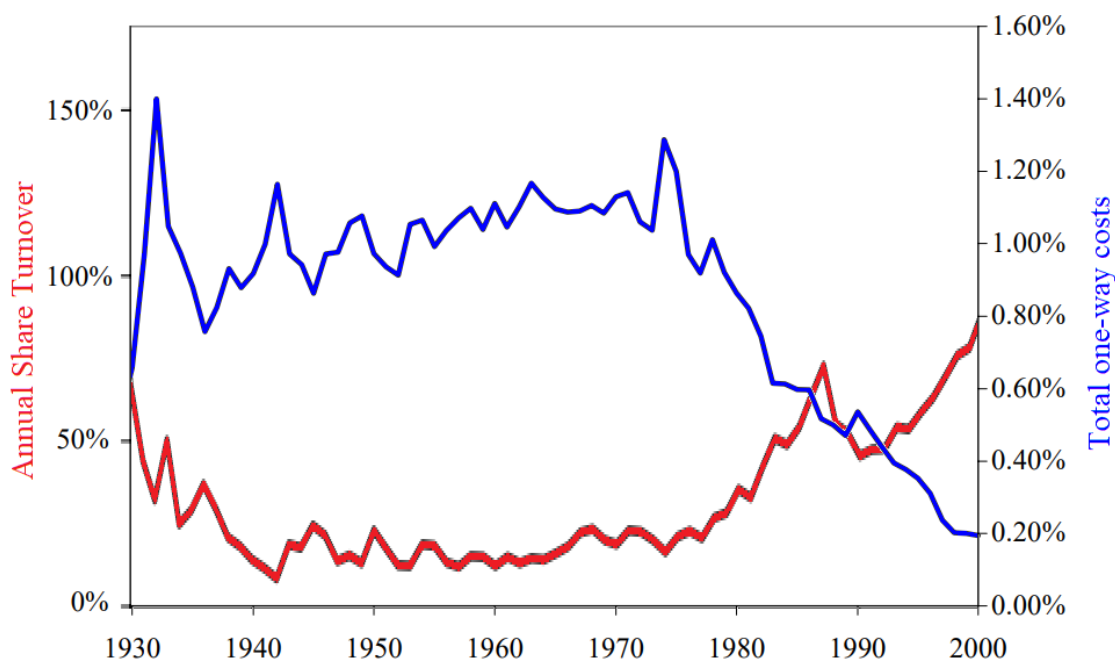


Figure 1: The relationship between trading costs (commissions and bid-ask spread) and annual share turnover rate between 1930 and 2000 (Jones, 2002)

3.3.1 The beginning of online investing

Barber and Odean (2002) looked at online investing between 1991-1996. During this period, only a small proportion of the people used such platforms. They looked at the differences in characteristics and the difference between their behaviors and outcomes compared to people using traditional, phone-based brokerages. They found multiple overconfidence-related phenomena which could explain these differences. First, they acknowledged, that the people who started using online platforms during the examined time were not representative. Before going online, these people had a good recent record, outperforming the market by 2%. This fits into the relevant literature. This is self-assessment bias: by achieving good returns, they became more overconfident (Gervais and Odean, 2001). This led to them seeking opportunities to trade more frequently and more easily. Online brokerages provided this, as

well as lower commissions, which could mean that rational investors would have been better off using such platforms. Barber and Odean also hypothesized that the illusion of knowledge and the illusion of control may play part in online investor behavior. By using online platforms, traders had more information available than their counterparts. While this increases their accuracy slightly, it increases their confidence in their knowledge much more, which may lead to a higher level of overconfidence for them. Traders may also fall victim to the illusion of control: they may believe that because they are more involved in trading, their actions may have an effect on the outcome. Online brokerages also offered lower commission rates during this period, which, together with overconfidence, led to the sample to trade much more frequently, and engage in trading stocks with lower capitalization and higher risk. While they were able to outperform the market before going online, because of this excessive trading they fared worse than their peers after switching, even when accounting for their lower commissions.

3.3.2 *The effect of excessive information*

Barber and Odean (2007) shows that exceptional attention-related events regarding single stocks have different effects on individual investors and professional money-managers. They start their research with pointing out that individuals have limited attention, therefore they will not be able to follow thousands of stocks to make their decision. Instead, they will be more inclined to turn their attention to stocks which have recently been featured, either in the news, or by experiencing high trading volumes or low returns (or a combination of these factors). While it is important to note that individuals will not buy all the stocks that catch their attentions, empirical analysis shows that they will buy a larger portion of stocks which were attention-grabbing. The authors point out that the two main differences in this regard between household traders and professionals is that larger firms may have more resources to track a larger number of stocks, and that households are less likely to take short positions. This latter fact is important, as it shows that the act of buying and selling is not the same for individual investors, contrary to many literature. While this is in some part due to the restraints regarding short selling for individuals during the examined period, Barber and Odean factored this in, and looked at how traders acted with the assets they owned.

Generally, they sold stocks that they owned more than bought extra, but this tendency was distorted after attention-grabbing events, meaning, that when they had the option to "short" a stock (by selling what they owned) after related news, they were still net buyers instead.

3.4 Returns of retail investors and their effects on markets

To conclude this chapter, I looked at literature regarding perhaps two of the most important questions relating retail investor behavior. These are concerned with the effects of their behaviors on their prospects and on financial markets.

3.4.1 *Retail investor returns*

Barber et al. (2009a) describes entire returns for a 5 year period between 1995 and 1999 on the Taiwan Stock Exchange. While this research should not be interpreted exactly for the United States, there may be similarities between both investor behavior and the extent of returns. The authors find that individuals suffer staggering losses and underperforming market returns by 3.8% annually. They attribute this deficit to four factors: taxes (34%), commissions (32%), trading losses (27%), and market-timing losses (7%). They note that this loss is economically significant, 2.2% of Taiwan's GDP during the sample period. Barber et al. also looked at institutional investors' returns and found that they achieved a 1.5% positive abnormal return. This was at the expense of retail traders' trading losses. While taxes and commissions are redistributions within the country, almost half of all returns for institutes were achieved by foreign institutions. Interestingly, they found that the reasons why retail investors trade is not exactly the same as in the United States. While rational reasons, for example, liquidation needs, were responsible for similar amounts of trade, the total turnover rate was almost three times that of US investors for the sample period. This was explained by two factors. First, overconfidence rates were reported to be higher on average (Yates et al., 1988). Second, gambling was illegal during the sample period in Taiwan. Because of this, individuals who desired to gamble could only turn to financial markets. Such people were hypothesized to be subject to higher turnover rates.

Barber and Odean (2013) summarizes previous studies focusing on both long-term and short-term performances of individual investors. They repeatedly find that individuals who hold assets for a long time-horizon (more than a few weeks) severely underperform market returns in multiple countries and sample times. Considering that the average stock is held by investors for 16 months (Barber and Odean, 2000), this is in line with retail investors having negative abnormal returns as a whole. Contrary to this is short-term performance, which shows that individuals are able to profit when holding assets for less than a month. Kaniel et al. (2008) finds that after a decline in the price of an asset, intensive buying can be seen by retail investors. The asset's price is shown to increase on average in the following month, and traders who sell after a short period are able to achieve superior returns compared to the market return. While the fact that long-term individual holders are net losers is confirmed in most research, the same cannot be said about short-term results. While US-based researches indicate its prevalence, Barber et al. (2009a) shows the opposite in the Taiwan Stock Exchange.

Garay and Plugra (2021) finds that when accounting for measurable characteristics of individuals, such as their turnover rate and the riskiness of their portfolios, the experience can be a significant factor in profits. They analyze the Colombian stock markets and find that retail investors underperform by 4% on average. There is a group among them, however, which, even after commissions, can achieve superior returns. They looked at how long someone has been investing and how experienced they were and found that those with the most expertise were able to consistently have positive abnormal returns.

3.4.2 *The effect of retail investors*

We have seen that the general consensus in the related literature is that retail investors underperform their peers on average. Another factor worth analyzing is to see if they have an impact on markets as a whole. Barber et al. (2009b) analyzes samples between 1983 and 2001. It is worth noting that during this period computer-based trading was not as well widespread as later on. The authors look at individual stocks' previous returns compared to moving reference points and how large amounts of buying or selling impacted their future prices. They found that retail investors tended to act together; they systematically bought or sold certain

stocks at a given time. In the short run (1 week), stocks that were bought by retail investors performed well, while stocks that were sold performed poorly. When looking at the following year, however, Barber et al. found that the opposite was true: stocks that a large number of retail investors bought a year ago underperformed by 4.4%, while stocks which they sold achieved returns above-market returns. To see that there is causality in these correlations, they controlled for the market capitalization of stocks. They found that stocks with smaller capitalizations were more subject to these phenomena, while large-cap stocks were less influenced by them. This can be because individuals do not have the power to move such large stocks, but they have influence over a portion of the stock markets: small-cap stocks.

In 1983, NASDAQ introduced completely computer-based trading. This started a new phenomenon that gained ground in the 2000s and became prevalent in the 2010s. This is high-frequency trading. The basis of the concept is that by using algorithms, computers are able to complete transactions in a fraction of a second. This method was soon responsible for a large portion of the completed transactions in financial markets. This method influences both retail investors' profits and effects. Algorithms are rational agents, and they can gain at the expense of irrational household investors McGowan (2010). Despite this, they will still not be able to exploit all arbitrage, as the risk factors associated with noise traders can still not be precisely calculated. While high-frequency trading can be poor for irrational agents, Malinova et al. (2018) shows that they may be useful for markets. They analyzed how market liquidity changed when Canada introduced a regulatory fee concerning transactions completed by algorithms. What they found is that after the implementation, trading frequency slightly decreased, and this led to a wider bid-ask spread. This spread can be looked at as a commission emerging from imperfect markets. It lowers net gains; therefore, the authors concluded that the regulation hurt individual investors by raising their costs of trading.

4 Retail investor environment in the present days

We have arrived at a point in history where rational investors are in the most preferable position. The investing community has access to all the information necessary, and since 2019 commissions have been as low as zero at major discount brokerages. Despite these facts, anomalies and biases can still be seen, and retail investors are often still underperforming compared to market returns.

4.1 Commissions

We have seen that the declining commission rates have slight effects on retail investor behavior. The largest marginal increase in the number of household investor trades is at the commission rate of 0 (?). This was first achieved by Robinhood, a mobile brokerage platform founded in 2013. As we will see, this zero commission does not entirely translate to zero price paid by users; however, retail investors demanded lower commission costs from other platforms as well, and in 2019 October some of the largest retail investor brokerages (Charles Schwab, E*Trade, TD Ameritrade, Ally Invest, Fidelity) all set their basic commissions to zero.

4.1.1 *Payment for order flow*

The natural question to ask when faced with the fact that brokerages do not generate revenues from commissions is how these companies can still make profits. The answer is that they increased their reliance on payments for order flow. With this practice, brokerages do not send orders directly to public exchanges but sell them to wholesalers, who execute orders at a slightly improved price. This practice is subject to criticism, as brokerages do not fulfill their duties of providing executions. Adams et al. (2021) looks at how payment for order flow influences retail investors. While they do not pay commissions directly, the paper compares how payment for order flow affects bid-ask spreads. The larger the spread, the less optimal trades are for retail investors, and the smaller their profits are. Adams et al. uses a difference-in-difference estimator to see how the spread changes after 2019 October. They

find that orders which used to cost \$5 for retail investors in commissions cost only \$1.76 in spreads after zero-commissions were implemented. The authors conclude that retail investors who have accounts with zero-commission brokerages, therefore, benefited from this change. They note that this benefit is *ceteris paribus*, meaning that investors only gain if they do not trade more than previously, as it can hurt their returns (Barber and Odean, 2000).

Barber et al. (2021) looked at other effects of zero-commission brokerages on retail investor activity, focusing on Robinhood. Almost all of the platform's profits emerge from payment from order flow. The company receives 20 cents of revenue from each 100 shares redirected to Citadel Securities, a market maker. This means that the company's best interest is to have its users execute more trades. Indeed, this is what they find. Other large brokerages, which originally made profits from commissions, provide a more traditional trading experience. Contrary to this, Robinhood makes trading as intuitive as possible. As a result, users of Robinhood trade 9 times as many shares as E*Trade users and 40 times as many as Charles Schwab users, two of the largest traditional retail brokerages (Popper, 2020). The authors argue that this excessive trading hurts investors, even when controlling for no commissions (Barber and Odean, 2000).

Payment for order flow has now been suspended partially or completely banned in a number of countries, such as Canada, Australia, the United Kingdom, and since December 20, 2021, the European Union. Despite these bans, we can see that commissions are as low, or even lower, than those of the United States' largest brokerages before they implemented zero-commissions.

4.1.2 Zero-commission brokerages

Rather than focusing on payment for order flow, Jain et al. (2021) looks at how the rise of zero-commission brokerages affected markets and investor welfare. They find that both the number and the percentage of retail investors who had accounts at brokerages offering zero costs increased. The paper shows that the share of small trade orders also increased, likely due to higher participation of investors with low wealth. Such retail orders were more subject to payments for order flow, meaning that their execution was more uncertain. The study empirically confirms previous literature about the decrease of spreads and the increase of volatility as commissions decrease. Both Jain et al. (2021) and Adams et al. (2021) find that

there is uncertainty about the exact costs that retail investors bear. They argue that the main policy implication should be better informing of retail investors about the costs, as a large portion of them falsely believe that zero commissions are equivalent to zero costs.



Figure 2: On October 9, 2019, Ally Invest started using zero-commissions. As a result, average customer trades per day increased substantially afterwards, based on the company's quarterly reports

4.2 Information regarding retail investors

The 2021 retail investor survey (IFEC, 2021) presents a representative survey of individuals in Hong Kong. While there may be differences between countries, a number of results can serve as a benchmark to describe retail investor behavior in the United States. By comparing it to the 2019 survey, the study shows that the major impact of the COVID-19 pandemic was the acceleration of digitalization. 84% of respondents used digital platforms to invest, a 10% increase from 2 years ago. The risk appetite of investors is somewhat surprising. When asked, most people were able to categorize different assets by their risk. Despite this, a significant portion of retail investors were risk-seeking and traded more often with risky assets such as derivatives. This was especially true for young males; over 50% of them responded to be

looking for short-term gains and having high-risk tolerance. Compared to the 2019 survey, this way not a new phenomenon. The rates of people investing in different asset classes remained mainly similar during the pandemic. Finally, the survey tells us relevant information about the information sources of retail investors. The two primary sources of information were financial websites (67%) and TV (62%). While these sources are usually subject to peer reviews, almost half the respondents, especially younger people, reported using stock trading forums and social media in their decision-making. This led to a third of all retail investors answering that they have made an investment decision purely based on social media.

4.2.1 Herding

We have seen in Barber et al. (2009b) that individuals tended to buy certain stocks together. They called this the herding effect. It can be used to predict both the short-term and long-term outcomes for an asset heavily bought or sold by retail investors. The effect was already prevalent before the widespread use of the internet. This can be mainly explained by TV shows related to financial news, and it affected bubbles of both individual stocks and markets. Hsieh et al. (2020) looks at the information demands of uninformed retail investors. They find that when information costs are low, herding is more prevalent. They looked at an extreme example regarding how individuals use free information offered by Google. They find that the search volume for given stocks can be a good predictor for near-future herding. This means that individual investors tend to herd not because of a price movement but because of external factors, such as news or social media, which in turn leads to price movements. Hsieh et al. also finds that during bull markets, herding is more influential in increasing prices than during bear markets.

Eaton et al. (2021) compares the herding effect on two groups of retail investors: uninformed and sophisticated. They compare outages of Robinhood and other retail brokerages based on the assumption that users of Robinhood are less sophisticated. They hypothesize that periods when Robinhood users are unable to trade, will see less herding, while the outages of traditional brokers will lead to a higher portion of Robinhood traders, therefore a higher level of herding. They confirm this empirically, both based on market evidence and external sources. Social media mentions of stocks have had larger effects during

traditional brokerage outages. Eaton et al. finds that Robinhood users have an effect on market quality. During outages of Robinhood, stocks preferred by its users experienced reduced bid-ask spreads and lower volatility, which increased investor welfare.

4.2.2 *Attention grabbing*

Commission may be seen as a form of punishment for irrational trades made. This can mean that investors will question their sources more severely when they have to pay the price for their actions. This effect diminishes as costs become low and commissions are advertised as zero. Clarke et al. (2021) looks at the impact of fake articles on financial markets. They find that while they have no effect on market prices, they affect individual behavior. The research looks at 2017 data, meaning that zero-commission brokerages were not widespread, although fees were already low. They find that people are unable to distinguish fake articles from legitimate ones, but they are more willing to share them. For bullish writings about a stock, this leads to an immediate quick increase in the price of the asset. The paper finds that algorithms are useful at countering this phenomenon. They are both able to predict if an article is fake, and they act quickly to exploit the arbitrage created by the false valuation of the information. This is, however, done at the cost of the retail investors who acted on the article. As a result, attention-grabbing fake news does not affect markets, but only results in a wealth transfer from unsophisticated retail investors to trading algorithms.

4.3 Retail investor behavior in the present days

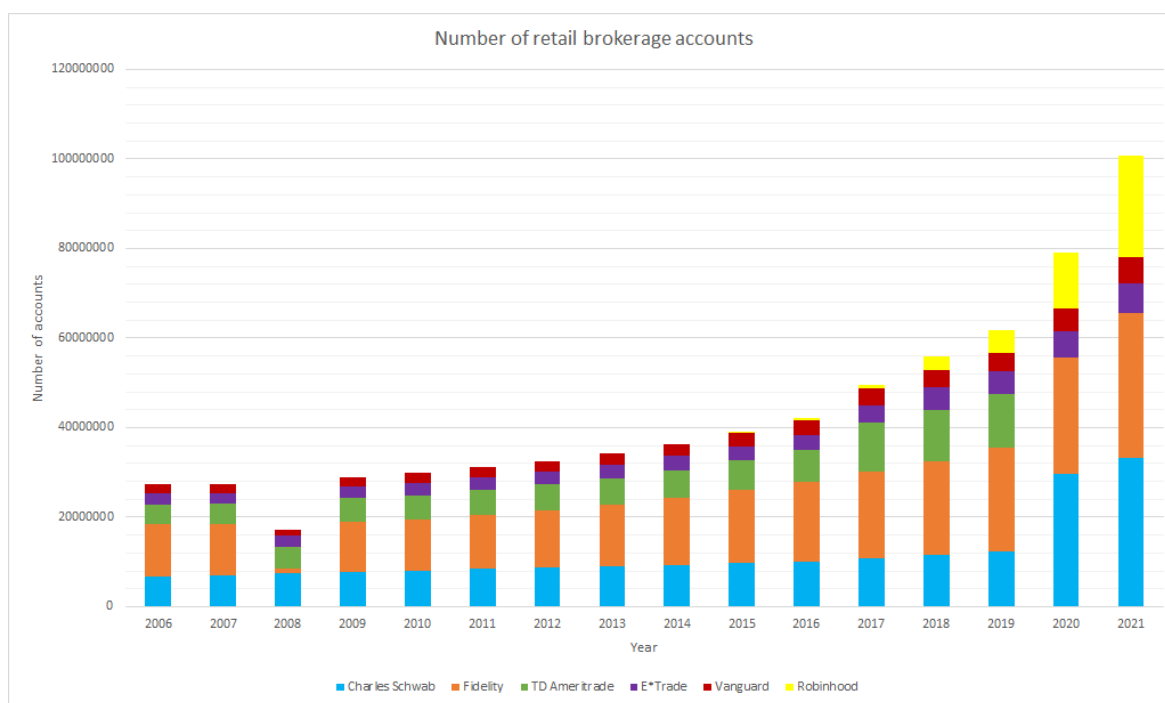


Figure 3: The number of retail brokerage accounts at the largest US-based brokerage firms based on their annual reports (note that Charles Schwab acquired TD Ameritrade in 2020, hence the shift in numbers regarding the two firms)

4.3.1 Fear of Missing Out

A recently popularized term regarding retail investor behavior is the fear of missing out. No doubt, this phenomenon has become more prevalent due to social media. This has had an effect on both new and existing investors. Shiva et al. (2020) shows in an experimental setting that investors who use their phones for trading are more susceptible to the effect. The authors show that inexperienced people rely on their mobiles to gain information and that in the absence of their phones, people are less likely to be subject to overreaction and therefore want to conduct excessive trading. This is a crucial finding, as Robinhood only has a mobile platform for trading, and almost half of its users are first-time investors (Steinb, 2021). Potsaid and Venkataraman (2022) shows in another experimental setting that transactions not made by investors due to outages can have an effect on their future behavior. They find that when participants would

have gained from a trade but were unable to make the transaction due to an outage are more affected by the phenomena than those who would have lost on their trade. Controlling for the participants' initial level of fear of missing out, they find that those who believe they could have gained from a transaction are more likely to take part in excessive trading afterward. The authors believe that this can be translated into real-life settings, where uninformed, amateur people are more likely to start trading when they see potential returns they missed out on. As recent years saw an increasing amount of social media news related to investing, together with zero commissions, this could have been a cause of the increase in the number of retail investors.

4.3.2 Excessive trading

Due to the ability to trade without commissions in seconds, the turnover rate for retail investors substantially increased recently. In many cases, amateur investors sell the asset they bought within hours, engaging in the more risky act of day trading. There are two ways retail investors day trade. The first is how other professionals do it, by buying and selling assets within hours, even minutes. This practice has been found to end in losses for more investors (Barber et al. (2009a), Chague et al. (2020)). Despite this, Chuang (2011) finds that in given circumstances, individual investors are more confident than institutional investors, and take part in day trading more aggressively. Market circumstances can make retail investors more overconfident, during bull markets they assess risk poorly, and buy more risky assets than their institutional counterparts. Recently, a different option became available for retail investors. Instead of having to make the trades themselves, they are now able to copy others. This practice has two shortcomings. First, As the majority of investors are unable to outperform the market by day trading, copying them will also most likely result in underperformance. Second, the practice has been shown to be too risky for the tolerance of the average retail investor. Stein et al. (2022) finds that a representative sample of retail investors would not make the same trades as a day trader that people copy, as they consider it too risky.

Guddati and Bhat (2021) produces qualitative research about how investor behavior changed with more accessible investing. They find that zero-commission brokerages have a tendency to make their users become addicted to investing, often resulting in trades made without any underlying thought. This has been identified as gambling, Mathieu and Varescon

(2021) shows that due to higher risk-seeking, this can lead to investors engaging in unnecessary risk-taking by trading with assets such as derivatives. The authors conclude that despite its long-term result of almost certain loss, a large number of retail investors continue to buy these assets due to overconfidence and loss aversion. Mosenhauer et al. (2021) finds similar results focusing on portfolio turnover rates and problem gambling. They find that self-reported gamblers and those who have similar portfolios to them have especially high turnover rates. They conclude that due to the nature of the problem, more intervention is needed regarding brokerage regulations.

5 Conclusion

Retail investor behavior is subject to a number of heuristics as well as investing circumstances. This paper looked at different behavioral phenomena and how they can affect decision-making. Loss aversion and overconfidence are two of the most impactful biases; they can lead to individuals losing sizable portions of their wealth and underperforming market returns. Just by letting people know about these heuristics and biases can change their decision-making (Dale, 2015). As a result, they may act more thoughtfully, more rationally, which would increase their welfare.

The paper looked at how changes in information and commission structures affected both retail investor behavior and, therefore, investor returns. The almost infinite amount of information available can lead to overreaction. It can be said that commission costs will never be as high as a few years ago. In their current situation, zero-cost brokerages may become ever so prominent. This, however, poses two critical problems. First, brokerages do not fulfill their services as best as they can due to payments for order flows. Second, together with biases, the low commissions may result in excessive trading, which can lead to inferior returns (Odean, 1998b). As we could see, a minimal increase in commissions may already lead to the average active trader to execute substantially fewer trades than when they are faced with no costs of doing so. As costs were already a fraction of a percentage, we can predict that a governmental ban on payments for overflows would solve both these problems. We can see that countries that implemented such bans saw their household investors have better net returns despite the return of commissions.

Brokerages would not suffer costs from this, as they would revert back to increasing their commissions to the market equilibrium. Active retail investors would be more hesitant to trade, which would mean that they will make more rational moves, and as the commissions would still be meager, they could benefit from the situation. Perhaps the group most negatively affected by this are passive household investors. Even with payment for order flow, we saw that the orders are executed almost perfectly, meaning that household investors, who are okay with

slight faults in execution, as they will still be able to purchase their assets at a price they would pay for them, are only concerned with the commissions. As the rates would go up from 0%, their returns would decrease by whatever the equilibrium commission rate is.

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