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Transition From Online Platforms to Mobile Apps: How Has Retail Investor Behavior Changed

The Role of Overconfidence and Attention Bias

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ABSTRACT:
This thesis examines how the evolution of digital investing, from early online platforms to modern mobile investment applications – has transformed retail investor behavior. Earlier online trading platforms increased market access and reduced transaction costs; more recent research provides evidence that mobile trading applications have added features like real-time feedback, push notifications and gamified interfaces.

The Efficient Market Hypothesis provides a theoretical framework for rational investor behavior. Against this framework, the study focuses on how the digitalisation of investing has progressively enhanced behavioural biases of retail investors. This study is conducted as a literature-based review of prior theoretical and empirical studies on digital trading platforms, mobile applications and investor decision-making.

The reviewed literature consistently supports the finding that mobile applications have substantially increased retail investor trading frequency. Evidence also indicates that mobile environments amplify overconfidence and attention bias relative to earlier online platforms, though this amplification appears contingent on platform design and investor characteristics. Recent evidence further suggests that financial influencers and social media environments may function as external amplifiers of these biases. Whether mobile adoption has a net negative impact on risk-adjusted performance could not be established by the available evidence.

Overall, the findings suggest that mobile platform adoption produces a conditional trade-off rather than uniform benefits or costs. Improvements in market access and transaction costs coexist with documented behavioral costs and net effects on individual investors appear to depend on personal characteristics such as experience, risk preferences and financial literacy. Long-term empirical research measuring risk-adjusted portfolio performance across diverse retail investor populations would advance the field's ability to evaluate whether mobile app adoption produces net benefits or costs.

KEYWORDS: Behavioral Finance; Digitalisation of Investing; Mobile app investing; Retail Investor; Trading behavior; Portfolio Performance; Overconfidence; Attention Bias

Contents

Abbreviations

EMH = Efficient Market Hypothesis

MPT = Modern Portfolio Theory

DEP = Digital Engagement Practices

CPT = Cumulative Prospect Theory

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I would like to mention that I have used a language model (ChatGPT 5.0) for general grammar checks and proofreading. The thesis was written, and the research was conducted by me; the model was not used to generate content or conduct research.

1 Introduction

Technological development has transformed financial markets over the past decades. Early online trading platforms made market participation easier for retail investors by improving access to financial information, lowering transaction costs and enabling faster trade execution (Barber & Odean, 2002). However, the later transition from desktop-based online investing to mobile investing applications might have fundamentally changed the investment environment again. Mobile applications allow all-time market access and include features such as real-time notifications, frequent feedback and gamified design. These features may influence retail investor behavior further and amplify speculative and more frequent trading among retail investors (Kalda et al., 2021; Liu et al., 2025; Chapkovski et al., 2026). Simultaneously financial influencers and social media increasingly shape how retail investors form views about specific assets and portfolio allocation (Hull & Qi, 2024; Lalwani, 2025).

From a traditional finance perspective, improved access to information and more efficient trading should lead to better investment decisions and improved performance for retail investors. According to the Efficient Market Hypothesis financial markets reflect all the available information and investors act rationally when making investment decisions (Fama, 1970). In an environment like this, features like lowered transaction costs and greater access to financial information should improve retail investors' performance. However, behavioral finance research suggests that investors do not always act rationally. Kahneman and Tversky (1979) found that decision-making is often influenced by psychological biases that lead to systematic deviations from optimal investment behavior

The literature seems to point out that behavioral biases, especially overconfidence and attention bias, are amplified most through online investment and later in mobile investment platforms. According to Daniel and Hirshleifer (2015) overconfidence leads investors to overestimate their ability to interpret financial markets, which leads to excessive trading. Attention Bias causes investors to focus on highly visible stocks rather than focusing on fundamental information. (Barber & Odean, 2008; Münster et al., 2024).

The digitalisation has therefore created benefits and risks for retail investors. Earlier online platforms improved accessibility and efficiency (Barber & Odean, 2002), whereas mobile apps have made investing more interactive, and information is available all the time (Barber et al., 2022). At the same time, research suggests that mobile investing may amplify overconfidence and attention bias, which can worsen the investor's performance (Barber et al., 2022; Liu et al., 2025). Studies have also provided contrarian evidence suggesting that the effects may depend on investor characteristics such as experience and risk preferences (Chapkovski et al., 2026; Pan et al., 2023).

Prior literature has mostly examined online and mobile investing environments in isolation, without assessing the effects of transitioning between them (Barber & Odean, 2002; Cen, 2024). Kalda et al. (2021) utilized 'within investor-time analysis' to isolate the technology's effect by comparing trades made by same individual across different platforms. Most empirical studies also remain constrained by single-platform or single-country datasets that limit the generalizability (Barber et al., 2022; Kalda et al., 2021; Liu et al., 2025; Freibauer et al., 2026). Furthermore, the effect of mobile platform adoption on a long-term risk-adjusted portfolio performance remains empirically unsolved, possibly since subject is novel and longitudinal data at sufficient scale is not available yet. This study aims to address these gaps by synthesizing the available evidence based on prior empirical literature.

1.1 Purpose of the Study

Purpose of the study is to provide an answer to the following research question: How has the transition from online trading platforms to mobile investment applications affected retail investor behavior and to what extent do overconfidence and attention bias explain any associated changes in investment performance? To address this question, study will next introduce three hypotheses that are based on the research question and derived from existing literature.

Online-based digital platforms reduced transaction costs, increased accessibility and provided real-time market information (Barber & Odean, 2002). Furthermore, modern mobile-based applications provide push notifications and social comparison (Andraszewicz et al., 2023; Arnold et al., 2022). These can be seen as factors that can lead retail investors to trade more frequently. Hence, hypothesis one is as follows:

H_1: Mobile investment applications have increased retail investors' trading frequency.

Behavioral finance studies assume that investors are prone to cognitive biases. Since modern investment platforms offer gamified features, real-time interaction, social comparison, and push notifications, these could be factors that raise the level of overconfidence among retail investors and encourage them to engage in attention-based trading.

H_2: Mobile trading amplifies behavioral biases, particularly overconfidence and attention bias.

Prior literature has established that overconfidence-driven trading lowers the performance of retail investors through excessive turnover and poor market timing (Barber & Odean, 2001; Barber & Odean, 2002). As Barber et al. (2022) found, these effects appear to be intensified by mobile platforms. Modern platforms also utilize DEPs that can coordinate attention and decrease psychological perception of risk (Grant et al., 2024). Consequently, the third hypothesis is as follows:

H_3: Mobile-based trading environments have a significant negative impact on the risk-adjusted portfolio performance of retail investors.

1.2 Structure of the Study

This thesis is constructed of four main chapters. Chapter one introduces the study, including the motivation, research question and hypotheses.

Chapter two introduces the theoretical background of the study, including the Efficient Market Hypothesis (Fama, 1970) and key behavioral finance concepts: Overconfidence and Attention bias.

Chapter three reviews empirical literature on digital investing, focusing on the transition from early online platforms to mobile applications and how this transformation has influenced retail investor behavior and performance.

The fourth and final chapter summarises the main findings and discusses their implications for understanding how retail investor behavior and performance change with the adoption of mobile applications.

2 Theoretical Background

This chapter examines the theoretical foundation of this study. Theory is based on a rational investor framework that exhibits how investors would make decisions if they acted completely rationally, and markets were efficient (Fama, 1970). However, empirical evidence suggests that investors do not always behave rationally. This is the second phase of the theoretical background, the behavioral finance framework, which explains how psychological factors influence financial decision-making. Within this framework, the chapter focuses on overconfidence and attention bias, the two most relevant behavioral concepts in this study.

2.1 Rational Investor Framework

Traditional finance theory forms the foundation for financial theory and aims to describe how investors are assumed to make investment decisions in efficient financial markets. Within this rational framework, investors are expected to behave rationally, utilize all available information and maximize their risk-adjusted return. The next two sections will examine influential frameworks of traditional finance, the Efficient Market Hypothesis (Fama, 1970) and Modern Portfolio Theory (Markowitz, 1952).

2.1.1 Efficient Market Hypothesis and Modern Portfolio Theory

Fama (1970) introduced the Efficient Market Hypothesis (EMH) which is a centrepiece of the rational investor framework. The Efficient Market Hypothesis assumes that financial markets are informationally efficient. The hypothesis also assumes that investors process this information rationally. Under these assumptions, asset prices should always reflect all available information, making it difficult for investors to consistently achieve abnormal risk-adjusted returns.

If all the assumptions made in EMH hold, asset prices should follow a random walk, and changes should be unpredictable. The validity of the Efficient Market Hypothesis can be

challenged by early empirical evidence, for example, De Bondt and Thaler (1985) documented systematic overreaction in stock prices. Their findings show that past losers tend to outperform past winners in the stock market, which can be seen as contradicting to EMH, which assumes price changes to follow a random walk.

Another traditional finance theory is the Modern Portfolio Theory (MPT), developed by Harry Markowitz (1952). Modern Portfolio Theory suggests that portfolio managers and investors are rational and risk averse. According to Markowitz, an investor's portfolio consists of diversified assets and the portfolio achieves an optimal return given to the risk. Theory provides a concept for portfolio diversification and demonstrates how diversification can offer investors optimal risk-adjusted returns. MPT offers a framework for understanding portfolio construction and risk management in financial markets (Markowitz, 1952).

Modern Portfolio Theory and Efficient Market hypotheses provide a theoretical benchmark for how rational investors should behave and how financial markets should function ideally (Fama, 1970; Markowitz, 1952). However, empirical evidence presented in behavioral finance studies has shifted the focus more towards the psychological factors of investors that influence investor decision-making. Kahneman and Tversky (1979) introduced the Prospect Theory, which suggests that investors are loss-averse, meaning that losses are perceived more strongly than equivalent gains. Kahneman's and Tversky's study has inspired the behavioral finance field and various behavioral biases have been found that affect the decision-making of investors. The next section introduces the behavioral finance framework and examines the cognitive biases that are most relevant for this study.

2.2 Behavioral Finance Framework

Behavioral finance emerged as a response to the limitations of traditional financial theories that assume investors behave fully rationally. While these frameworks assume

investors to process information and make decisions rationally, empirical evidence has demonstrated that psychological and cognitive biases influence financial decision-making. Behavioral finance, therefore, aims to explain systematic deviations from rational investor behavior by incorporating psychological factors into financial theory.

As presented in the previous section, Prospect Theory, introduced by Kahneman and Tversky (1979), is a foundational contribution to the field of behavioral finance. It suggested that individuals are loss-averse and evaluate gains and losses differently. Subsequent research has identified several psychological and cognitive biases that affect financial decision-making, such as overconfidence, attention bias and mental accounting.

This study will have a specific focus on overconfidence and attention bias. These biases are particularly relevant in environments where investors receive frequent feedback, are granted a large amount of information and decisions are made under uncertainty.

2.2.1 Overconfidence

Overconfidence is one of the most studied cognitive biases in finance. In the context of financial decision-making, overconfidence refers to investors overestimating their knowledge and ability to value assets (Daniel et al., 1998). In latter study Daniel and Hirshleifer (2015) found that as a result, investors seem to believe that they are better at predicting markets and identifying profitable investment opportunities and this leads investors to trade more aggressively and frequently. Overconfidence will be particularly relevant when investors are provided with frequent feedback on their performance, reinforcing investors' belief in their own skill even when outcomes are always partly driven by randomness.

Barber and Odean (2001) had the same kind of findings that suggested that overconfident investors tend to trade more frequently since they often overestimate how accurate the information they have and how well they can predict asset performance in the future. According to Barber and Odean (2002), self-attribution bias, illusion of

knowledge, and illusion of control are three main reasons that make investors feel overconfident. They also found that overconfidence and frequent trading often lead to higher transaction costs, which may negatively affect portfolio performance. Barber and Odean (2001) also predicted in their study that men would be more overconfident than women. Empirical evidence proved that men traded 45% more than women, at the same time the net returns of men were weaker which supports that higher trading frequency lowers investor net returns.

Statman et al. (2006) also found that overconfident investors trade more often. Through empirical research, they also suggested that investors become more confident and trade more frequently after experiencing positive market returns. So, according to this study, overconfidence is also affected by the recent performance of an individual (Statman et al., 2006).

It is important to note that there are also studies that find evidence suggesting overconfident investors perform better. Benos (1998) found that overconfident investors earn better results than rational informed traders. According to a study, overconfident investors gain an advantage over rational investors by exploiting first-mover advantage.

In addition, different individual characteristics may have contributed to overconfident trading behavior. Grinblatt and Keloharju (2009) analysed overconfidence and attention seeking, by measuring the number of speeding tickets. They found that overconfidence and attention seeking correlated with frequent trading and negative net returns. One result was that attention-seeking increases trading frequency more than overconfidence. (Grinblatt & Keloharju, 2009).

Overall, prior research suggests that overconfidence is a significant influential bias shaping investor behavior. Although some studies demonstrate that overconfidence among investors may occasionally lead to superior performance (Benos, 1998), most of the evidence indicates that it contributes to increased trading activity and higher transaction

costs, which often results in lower net returns (Barber & Odean, 2001; Daniel & Hirshleifer, 2015). Examining overconfidence in the context of digital trading platforms, where there is more constant information and salient features, which may amplify overconfident behavior for retail investors, will be done in detail in the chapter three of this study. The next section examines attention bias, another key cognitive bias that affects how retail investors process information and make investment decisions.

2.2.2 Attention Bias

Attention bias is another significant behavioral factor that affects investor decision-making. This cognitive bias becomes particularly salient in environments where investors are exposed to a large amount of information. In financial markets, and especially in modern investment platforms, investors face numerous investment opportunities simultaneously, which can make it difficult to process all available information efficiently (Barber & Odean, 2008).

According to Barber and Odean (2008) investors solve the problem of searching what stock to buy by purchasing stocks that have recently caught their attention. Retail investors are more prone to attention-grabbing stocks compared to professional investors, since individual investors don't have the time and resources professionals have. Study found that abnormal trading volume occurs among individual investors when stock has had extremely negative or positive one-day returns or when stock has been in the news. (Barber & Odean, 2008).

Further evidence on attention-driven investment behavior was provided by Da et al. (2011), who were the first to introduce a direct measure of investor attention by using search frequency in Google (SVI). Findings suggested that increased search intensity is associated with higher trading frequency and increased short-term price movements for asset.

Investors also seem to increase trading activity when stocks or market events become contextually or visually more salient, even when fundamentals of a particular stock have not changed (Frydman & Wang, 2020). Study had a sample period from Chinese brokerage firm from early 2000s; the sample proves increasing salience through information display led to 17% increase in the disposition effect. The Disposition effect means that investors are more likely to sell winners too early and hold on to losing positions for too long (Odean, 1998). Frydman and Wang assume that results are more applicable today in digital trading platforms, where information and returns can be more visually salient for investors.

Additional evidence on the effects of attention bias was provided by Arnold et al. (2022), as they examined how attention triggers influence the risk-taking behavior of investors. Study provided evidence attention triggers, which in this case were push messages sent to investors lead to increase in risk-taking. Evidence also pointed out that individual characteristics such as age, gender and investing experience influence how attention stimuli affect decision-making. Findings suggest that attention does not solely guide which assets investors consider, but also affects the level of risk investors are willing to take (Arnold et al., 2022).

In conclusion, research shows that attention bias has a crucial role in explaining retail investor decision-making. Many studies have found that especially retail Investors tend to focus on stocks and signals that are salient and easily noticeable, whether it happens due to extreme price movements, media visibility or search activity (Barber & Odean, 2008; Da et al., 2011; Frydman & Wang, 2020). This selective attention investors perpetrate in can increase trading activity (Da et al., 2011), strengthen disposition effect (Frydman & Wang, 2020) and affect the willingness of risk, investors are willing to take (Arnold et al., 2022). Arnold et al. (2022) also pointed out that age, gender and financial experience affect how strongly investors react to attention stimuli. Similarly, Barber and Odean (2008) found that professional investors are less prone attention-grabbing stocks compared to retail investors. Results also suggest that digital trading platforms, where

trending stocks are often highlighted, and performance data is salient, attention bias could be even more pronounced.

3 Transition to Mobile Investing and Its Effects on Investor Behavior

This chapter will review prior empirical literature on digital investing and will examine how the transition from early online trading platforms to mobile investing applications has influenced the behavior and performance of retail investors. In chapter two, the theoretical concepts of overconfidence and attention bias were introduced. This chapter will focus on how these occur in different digitalized investment platforms.

3.1 Evolution of Digital Investing Environment

Digitalisation has significantly transformed the way retail investors participate in financial markets, evolving from traditional broker-assisted model to autonomous digital environment. The first phase, beginning in the 1990s and 2000s, introduced online brokerage platforms, which lowered transaction costs and enabled independent trading (Barber & Odean, 2002).

The second phase has emerged with the introduction of mobile trading applications. It has lowered frictions even more through constant accessibility, real-time notifications and gamified interfaces (Chapkovski et al., 2026; Liu et al., 2025). These features increase user engagement but may also trigger impulsive and attention-driven trading (Barber et al., 2022; Grant et al., 2024). Furthermore, mobile applications can often be integrated with social features such as leaderboards and comparisons with other investors more salient (Andraszewicz et al., 2023).

3.1.1 Online-based Trading Platforms

Moving to an online brokerage platform from traditional, phone-based or in-person broker-mediated trading significantly reduced market frictions by lowering transaction costs, faster execution speed and offering easier access to financial market. (Barber & Odean,

2002). It allowed retail investors to conduct independent research and trade autonomously without the need of intermediaries (Pan et al., 2023).

Online-based (PC) platforms created a so-called democratization of information, meaning retail investors were able to access the same information that had long been available primarily to professional investors (Barber & Odean, 2002). According to Liu et al. (2025) online investing also supports an analytical approach to investing, since computers have allowed retail investors to use tools to monitor performance, real-time quotes and even news feeds. As Barber and Odean (2002) stated the PC interface enabled retail investors to manage their portfolio almost in real time with a simple “click of a mouse”.

3.1.2 Mobile Investment Applications

The second major shift in the digital environment is the widespread adoption of smartphones and mobile-based trading applications. These environments differ from mostly stationary PC-based platforms, for example, in terms of ubiquitous access and integrations such as Digital Engagement Platforms (DEPs) (Grant et al., 2024; Liu et al., 2025).

According to Liu et al. (2025), mobile devices provide investors with constant 24/7 connectivity. This also allows investors to have immediate access to financial markets, regardless of time or location. This way, mobile-based investing has reduced temporal frictions and allowed investors to respond rapidly to market fluctuations.

Liu et al. (2025) also stated that the physical constraints of mobile devices, particularly small screens and limited computational power, have necessitated simplification of investing interfaces. In mobile platforms, complex data tools and datasets are replaced by streamlined interfaces and layered information (Barber et al., 2022; Cen, 2024). Similarly, Barber et al. (2022) found that while traditional online brokerages often provide hundreds of indicators, for example, the US-based Robinhood mobile trading platform provides only five charting indicators.

Grant et al. (2024) studied how the use of Digital Engagement Practices (DEPs) is also featured in trading applications, which include visual cues such as color codes for performance or other gamified elements that are usually designed to increase user engagement. Also, celebratory confetti and different achievement badges have been used to engage with platform users (Chapkovski et al., 2026).

Mobile environment has also transformed how retail investors acquire information; it has changed from a proactive search to passive reception through push notifications (Clor-Proell et al., 2020). News and market updates are transformed into shorter and more frequent pieces of information that are delivered straight to the user's device. According to Clor-Proell et al. (2020), this constant flow of information may increase the frequency of interactions with markets.

3.2 Overconfidence and Attention Bias in Mobile Investing Environment

The digitalisation of retail investing has also affected the psychological environment in which decisions are made. While behavioral biases such as overconfidence and attention-driven trading have long been documented in traditional and later in online settings, the shift towards mobile-based investing has increased their relevance (Barber & Odean, 2002; Barber et al., 2022). As described in chapter 3.1.2 mobile-based applications offer ubiquitous connectivity, simplified interfaces and constant information flow, and these can be seen as conditions in which rapid and emotionally driven decisions become more likely (Barber et al., 2022; Liu et al., 2025).

Mobile investing serves a simplified and "high-speed" interface that can determine which options investors consider before any analytical preferences are applied (Barber et al., 2022). According to Arnold et al. (2022), this kind of streamlined display and call-to-action features encourage retail investors towards faster non-reasoned decision-making.

Consequently it seems that, the mobile environment acts as a catalyst that does not necessarily create any new behavioral biases among retail investors but can possibly significantly amplify the salience of existing psychological vulnerabilities. These subchapters examine how mobile-based investing affects retail investors' overconfidence and attention biases and why these biases may become more pronounced in mobile settings.

3.2.1 Overconfidence

As discussed in Chapter 2.2.1, overconfidence refers to investors' tendency to overestimate their ability to interpret information and predict future market developments (Daniel & Hirshleifer, 2015). Compared to earlier investing environments, in mobile-based platforms, investors can observe short-term fluctuations in asset prices and portfolio values more frequently (Liu et al., 2025). Daniel and Hirshleifer (2015) also state that frequent feedback may increase the likelihood that investors attribute positive outcomes to their own skill through self-attribution bias. Barber and Odean (2002) suggest same as they introduced illusion of knowledge as a one factor contributing overconfidence in earlier online environments. It should be noted that the study was done over 20 years ago, but the same mechanism may intensify in mobile context where price information is more frequent.

In more recent study Havakhor et al. (2025) found that tech-enabled access to historical price data, feature that can be found on most investment applications seem to aggravate investors' overconfidence by intensifying illusion of control, illusion of precision and illusion of knowledge. This suggests that Barber and Odean (2002) findings may also apply to mobile based platforms. Randomized controlled experiment showed that individuals with access to high-volume historical data exhibit higher level of these three overconfidence-based illusions, which often lead to excessive trading and higher financial losses (Havakhor et al., 2025). They found that fundamentals may be set aside as the abundance of raw price data encourages retail traders to engage in data mining and discover patterns from the data which may increase sense of expertise. Similarly, Freibauer et al.

(2026) evidence points out that while retail investor interaction with markets has risen, it does not necessarily translate to a deeper understanding of market mechanics. They had longitudinal data from 14 months of investors using the Neobroker investment platform and found that investors' financial literacy might improve slightly but remains low overall. Their other study also suggests that Investors might believe they are becoming expert app users but remain unaware of the hidden costs and fundamental risks associated with speculative trading (Freibauer et al., 2024). Together these findings point to a notable asymmetry where: mobile platforms appear to amplify investors' sense of expertise (Havakhor et al., 2025) without producing corresponding gains in financial literacy (Freibauer et al., 2026).

In addition, simplified user interfaces may influence how investors make their investment decisions. According to Barber et al. (2022) and Cen (2024) mobile applications reduce the number of steps required to execute trades and information is presented through simplified displays. When the trading process appears straightforward, investors rely more on intuitive evaluation. As this is combined with immediate trade execution, it can foster an illusion of control, making it easy for investors to confuse easy trade execution for control over investment outcomes (Barber & Odean, 2002; Liu et al., 2025). While Barber et al. (2022) highlights significant behavioral shifts, their findings are primarily representative of a younger, less experienced Robinhood investors, which may limit the generalizability of the study. Similarly, Cen (2024) study has some limits since focus is on mutual fund investors in China. These mechanisms may also interact with the broader social information environment, Kim (2025) finds that social media engagement is associated with shorter investment horizons and increased trading frequency, particularly among younger and overconfident investors

Interactive design features may also contribute to increased confidence in investment decisions. Grant et al. (2024) performed a controlled experiment where they used fictional firm information and "virtual phone" to test investor behavior. Results showed that interaction features, such as swiping to trade, reduce the perceived "pain of paying",

which causes investors to focus on the potential upside of an investment rather than consider its risks. Chapkovski et al. (2026) also argue that gamified elements, such as visual rewards and simplified feedback, may also increase users' sense of progress and competence within digital environments. Their research also indicates that the impact of gamification is not universal but highly contingent on investor characteristics; gamified elements appeal more to investors with lower financial literacy and approximately 70% of the difference in trading acitivity is attributed to self-selection. This suggest that direct impact of new technology is not only contributing factor. Furthermore, the integration of different social features on platforms can trigger upward social comparison by exposing users to top-performing peers, which sets social reference points that may encourage excessive risk-taking and overestimation of achievable returns (Andraszewicz et al., 2023). Study provides evidence that experienced investors suffer from overconfidence, but results are based on simulated stock market where peer information is made more salient, so these effects may vary on real-world platforms.

Freibauer et al. (2024) studied 503 participants who use the trading-platform Neobroker and found that 47% out of all Neobroker mobile app users view investing as "casino substitute" and cite "thrill of investing" as a primary motive. They suggest overconfidence as one of the driving forces for this investment behavior. Findings also suggest that the longer people trade on this platform, the more their risk tolerance rises. Participants of the study were found to be significantly younger and more risk tolerant so results may not be totally generalized to other population.

Taken together, the available evidence suggests that mobile environments intensify the mechanisms identified in earlier online platforms, particularly in illusion of knowledge and illusion of control (Barber & Odean, 2002; Havakhor et al., 2025). The strongest evidence concerns the link between data availability and overconfidence-based illusions. Gamified and social features remain more contested, partly because effects appear contingent on investor characteristics (Chapkovski et al., 2026). Overall, the empirical

literature demonstrates that mobile platforms amplify overconfident behavior among retail investors on mobile applications.

3.2.2 Attention Bias

Attention bias was discussed in Chapter 2.2.2. It refers to investors tendency to focus disproportionately on salient, easily observable or attention-grabbing information rather than on fundamental analysis (Barber & Odean, 2008). Later in 2022 Barber et al. study found that mobile investing application Robinhood for example features a “Top Movers” list, where attention is focused on a little subset of 20 stocks based on absolute price changes, and investors using the platform are drawn to trading either extreme-winners or extreme-losers. However, it is again critical to mention that Robinhood demographic consist primarily of younger less experienced investors. Wu and Wu (2024) also demonstrated a stronger “ranking effect” on mobile devices than on PCs, as mobile platforms have limited screen estate, so less can be displayed at once. While Wu and Wu (2024) results provide strong evidence of salience in mobile applications and support Barber et al. (2022) findings, the study is centered in the retail-dominated Chinese stock market, so results could vary in markets with different regulatory structures or more institutional investor participation.

Freibauer et al. (2024) also report similar findings from self-reported survey data from a German investors as the Neobroker users relied on in-app suggestions and “popular stocks” lists (32%) and social media (29%) as primary sources for new investment opportunities, compared with only 7% and 9% among traditional investors. This reliance on platform-generated signals makes retail investors vulnerable to salience designed into the interface, as focus can be directed to a narrow subset of assets that are based on the app’s algorithms.

Mobile-based trading environments seem to intensify these dynamics, leading to attention-based trading. As Arnold et al. (2022) studied over 200 thousand investors from UK based brokerage firm, the results demonstrated that simplified digital displays and

prominent visual cues direct investors towards decisions based on salience rather than analytical inputs. Limitation of the study is that they examined a dataset of CFD traders, who may be inherently more speculative, and risk-seeking compared to general equity-investors. Clor-Proell et al. (2020) made the same kind of findings arguing that shorter, real-time and continuous information flow is shifting information acquisition from active search to passive exposure. It should also be noted, research also suggests that this impact may not be universal but highly dependent on an individual's personality; they measured "Fear of Missing Out" on investment information (I-FoMO); individuals with lower I-FoMO were largely unaffected by push notifications.

Overall, the evidence demonstrates that mobile platforms shape attention through two complementary channels: design features that surface only a narrow subset of assets (Barber et al., 2022; Wu & Wu, 2024) and user reliance on those platform-generated signals as primary information sources (Freibauer et al., 2024). The strength of these effects, however, may depend on individual characteristics (Clor-Proell et al., 2020), suggesting that mobile environments amplify attention bias more for some users. Similar with findings from chapter 3.2.1, the pattern points towards amplification of existing biases rather than creation of new ones.

3.2.3 Finfluencers and Social Information Channel

The digital transition of retail investing is not only limited to mobile app trading platforms. It includes a parallel social media ecosystem where financial influencers (finfluencers) also shape investor behavior. Finfluencers are seen as substitutes for fundamental analysis by curating complex financial data into simplified and salient messages that reduce information acquisition costs for retail investors (Hull & Qi, 2024).

Lalwani (2025) found that prominent financial YouTubers are disproportionately likely to recommend stocks with strong past performance and high trading volumes, which are characteristics of large short-term price movements. Results also indicated return predictability associated with these recommendations, as higher recommendations

predicted higher future returns. It is notable that the study also found retail investors can benefit from the finfluencers. The study concluded that recommendations made by financial influencers contain value-relevant information when used in conjuction with deeper analysis. Findings establish a link between finfluencer recommendations and retail investor market activity, but as the results are based on the Indian YouTube data, they may not fully represent the behavior of retail investors in other markets. Reichenbach and Walther (2025) studied Reddit users and made similar findings. Attention allocation among these users is concentrated on stocks with extreme values of the highest momentum, the lowest and highest market price-to-book values and highest market value deciles. They used Cumulative Prospect Theory and found that 50% of all positive posts on the three largest financial communities on Reddit (wallstreetbets, investing and stocks), are associated with stocks in the highest decile of CPT values based on prior returns. Generalizability of the results is limited because the original cause of stock selection cannot be causally determined, as Cumulative Prospect Theory valuations are highly correlated with momentum.

Financial influencers and the use of social media channels are also linked to amplified overconfidence and “short-termism”. Kim (2025) utilized U.S. survey data from National Financial Capability Study and found that social media engagement among retail investors is positively associated with shorter investment horizons and increased trading frequency. The effect seems to be particularly pronounced among younger investors and overconfident investors. The study links the same retail investor characteristics that have been associated with the transition to mobile applications. The data is self-reported, which may lower the validity of the findings. Furthermore, the study notes that sophisticated investors may avoid social media “noise”, suggesting that self-selection bias may attract the most vulnerable investors to seek finfluencer recommendations.

Hull and Qi (2024) provide the strongest causal evidence by studying how finfluencers affect investment behavior of retail investors on a Nordic social-trading platform. Exposure to finfluencers shapes retail investors portfolio choices and these patterns become

stronger for more popular and better-performing finfluencers. Hull and Qi (2024) also document significant home bias amplification, results indicate that finfluencers and their followers concentrate trading in local securities, reinforcing geographic concentration in portfolio. Unlike other studies reviewed in this chapter this study focuses on social-trading platform, where finfluencers invest on the same platform and users can copy their investment decisions directly. The Nordic-setting (Finland, Sweden, Denmark and Norway) could limit the generalizability of the study.

In conclusion, these findings extend the analysis of platform mechanisms to the broader social media ecosystem where retail investors operate. Mobile trading apps are used alongside social media platforms, meaning that platform-internal features such as push-notifications and ranked stock lists, with platform-external features such as financial influencer recommendations and social media attention dynamics, reinforce the same psychological vulnerabilities through complementary channels. Part of the evidence suggests that finfluencers are external amplifiers of the overconfidence and attention-bias mechanisms, especially directing retail investors attention toward attention-grabbing stocks (Lalwani, 2025; Reichenbach & Walther, 2025; Kim, 2025). While this influence appears robust across methodologically distinct studies, Hull and Qi provide nuanced causal evidence; suggesting that financial influencers may propagate home-bias and portfolio uniformity rather than speculative risk-taking. Overall, these findings contribute the Hypothesis 2 claim that joining mobile investing amplifies behavioral biases, adding an important note that the amplification operates through a broader information ecosystem rather than the trading app alone.

3.3 Impact on Trading Behavior

In previous chapters, this study focused on the environmental and psychological shifts that ensued from retail investors joining mobile-based platforms. This chapter aims to explain how these behavioral mechanisms may also affect observable trading behavior.

Based on prior empirical literature, the most prominent impact is a substantial increase in the frequency and volume of retail investing. This chapter quantifies these changes and examines specific drivers of the potential increases in trading frequency and attention-based investing that have been considered in prior academic literature.

3.3.1 Increased Trading Frequency

The adoption of mobile investment applications has been associated with an increase in the frequency of retail investors engage with financial markets. Cen (2024) used proprietary individual-level data from China, which indicated that mobile app adoption led to a 163% increase in login frequency compared to investors using traditional online platforms. The study also found that this increased engagement translated into trading activity, with trading volume increasing by approximately 102% following the investor's switch to the mobile app. Notably when Barber and Odean (2002) studied the effects of earlier transition from traditional phone-based investing to PC-based online trading, the annual turnover of investors was documented to increase from 73,7% to 95,5%, although the magnitudes may not be directly comparable, the increase associated with mobile adoption appears considerably larger.

According to Freibauer et al. (2024) similar findings can be interpreted from the Neobroker application users: app users executed an average of 3,83 manually executed trades per month compared to 2,53 trades per month executed by general online-broker users. It must be noted that when Freibauer et al. (2026) continued their study and had more longitudinal data, it indicated that trading frequency also stabilizes among application-users rather than continuing to increase indefinitely. More experienced German investors with an average age of 45 years and investing experience of 9 years also tend to increase trading frequency on mobile-based platforms, 10 trades per month made on mobile app versus five trades per month on online platform (Kalda et al., 2021). Kalda et al. (2021) studied over 200 thousand German investors and over 65 million transactions and findings are notable since results suggest that trading-frequency is not only confined

to the younger, less experienced investors (Barber et al., 2022; Freibauer et al., 2024) but extends to more experienced investor demographics as well.

Havakhor et al. (2025) provided a quasi-natural experiment linking improved data-access and trading intensity. Study examined the impact of the abrupt shutdown of the Yahoo! Finance API, the largest free data source for retail investors at the time, results indicated that retail trading volume dropped by 8,6% to 10,5% within one month of the API removal. The findings indicate that tech-enabled access to high-volume data sources increases the trading activity of retail investors. Such a high availability of the data through API's allows investors to implement nimble investment strategies that could be impractical to perform without modern investment applications and institutional-like raw data. It must also be noted that while the study examines data availability rather than mobile platforms specifically, the mechanism, high-frequency access to data enables more active trading, is relevant to the mobile contexts, where such data access is typically built in.

As mentioned in chapter 3.1.2, the reduction of transaction frictions is a main technological driver of increased trading frequency as making a trade in a mobile-based app requires a minimal amount of time (Liu et al., 2025). The graphic design of applications also seems to contribute to trading activity, according to Chapkovski et al. (2026). Celebratory animations and badges increase trading volume by an average of approximately 5%. They also noted that this effect seems to be much more pronounced for investors who self-select gamified platforms, as they tend to trade 21,4% more on non-gamified platforms as well.

Pan et al. (2023) studied a historical dataset of 7000 online investors for a 44-month period (2010 - 2013) at a large Chinese brokerage firm. They found that trading frequency is also affected by investor risk preferences. According to Pan et al. (2023), a 10% increase in online channel usage is associated with 18,53% increase in trading frequency for risk-averse investors, while the increase is only 10,52% for risk-seeking investors.

Although findings also suggest that risk-averse investors sell their stocks more gradually, resulting in lower overall trading volume per transaction. It should be noted that Pan et al. (2023) study does not focus on mobile investment applications, but overall findings suggest that digital access affects different investor types in different ways.

Across reviewed studies, the evidence consistently points to mobile platforms increasing retail trading frequency, with effects appearing across markets (China, Germany, US), demographics (younger Robinhood and NeoBroker users to experienced 45-year-old investors) and methodological approaches (quasi-experiments, longitudinal tracking). Magnitude varies substantially across different studies and effects are found to stabilize over time rather than escalating indefinitely (Freibauer et al., 2026).

3.3.2 Attention-driven Trading

Retail investor investment decisions seem to be increasingly triggered by external stimuli rather than fundamental research (Münster et al., 2024). Barber et al. (2022) found that retail investors on the mobile platform Robinhood concentrated 35% of their net buying in only 10 stocks, compared to 24% of the general retail investor population. According to the study, this concentrated buying can often be predicted by attention measures, such as extreme returns or unusual trading volume. As noted in earlier chapters, Barber et al. (2022) study concentrates on Robinhood investors, who are usually younger inexperienced investors and this may inhibit the generalizability of the results.

Arnold et al. (2022) studied CFD-traders and how attention triggers affect investment behavior when a brokerage firm is sending standardized push messages. Findings exhibit that the median reaction time between an investor receiving a push notification and executing an “attention trade” is documented to be only 1.35 hours. It has been demonstrated that attention triggers may also be formed by social media. According to Münster et al. (2024), for example, Reddit posts have a larger impact on net buying activity compared to traditional news articles. Study found that Robinhood users often buy stocks that are “trending” on social media, regardless of the sentiment of the posts, which can

be seen as attention-driven behavior. Similarly, Lalwani (2025) found attention-grabbing characteristics, as positive YouTube finfluencer recommendations outnumber negative ones by 5 to 1 and seem to be disproportionately focused on stocks with great past performance and high trading volume. This would indicate that trading platforms are not the only explanatory factor in attention-driven trading.

As mentioned in Chapter 3.2.2, Barber et al. (2022) found that on Robinhood, investors tend to focus on assets that appear on lists of the most extreme gainers or losers. Findings indicate a price reversal of - 4,7% in 20 following days is expected when the stock has had intense buying pressure by Robinhood retail investors. Similar evidence is provided by Da et al. (2011), who used different methodological approach with Google search volume as a proxy for investor attention. Their findings show that stocks experiencing a high level of investor attention tend to exhibit short-term price increases followed by negative abnormal returns. Wu and Wu (2024) also found that mobile investors are more likely to choose stocks featured at the top of various rankings. They found that the top group in these rankings has 9% higher buy-sell pressure on the mobile platform compared to the online platform. The study also points out that these attention-driven trading decisions occur more often among retail investors than among larger institutional investors, who are found to do the complete opposite.

Empirical evidence from German investors suggests that probability of purchasing lottery-type assets increases by 67% when the same individual switches from computer to mobile application. (Kalda et al., 2021). They also found that likelihood of trend chasing, meaning buying assets in top decile of past performers, increases by 12,0 percentage points on mobile platforms. Study was executed in Germany which may affect the generalizability through different regulatory environments but overall, these findings confirm that transformation from online brokerages to mobile applications increase attention-driven trading.

Taken together, the evidence for attention-driven trading on mobile platforms is unusually consistent across methodologically distinct approaches: proprietary platform data (Barber et al., 2022; Wu & Wu, 2024), push-notification reaction-time analysis (Arnold et al., 2022), search-volume proxies (Da et al., 2011), and social media impact studies (Münster et al., 2024; Lalwani, 2025) all point in the same direction. The pattern also holds across demographics, appearing both in the younger, less experienced Robinhood population (Barber et al., 2022) and in older, more experienced German retail investors (Kalda et al., 2021), and across multiple attention sources, including platform-generated rankings, broker push notifications, and social media discussion. The effect appears retail specific as institutional investors are found to trade in the opposite direction (Wu & Wu, 2024) and most relevant to this thesis, the magnitude seems to be consistently larger on mobile platforms than on traditional online platforms.

3.4 Impact on Retail Investor Performance

The transition from online trading to mobile applications has created a complex trade-off for retail investors. Barriers to entering the market have been significantly reduced; simultaneously, this reduction has introduced new psychological and technical costs that influence investment outcomes. This section evaluates and assembles the benefits and the associated behavioral and psychological costs and attempts to summarize the net effects.

3.4.1 How Retail Investors Have Benefited from Online Trading

Digitalization and the rise of mobile-based applications have been widely characterized as democratizing access to financial markets (Barber & Odean, 2002; Barber et al., 2022; Freibauer et al., 2024). The most immediate benefit is the reduction of transaction costs; commission fees have declined substantially in modern marketplaces (Barber & Odean, 2002; Cen, 2024; Freibauer et al., 2024; Pan et al., 2023). According to Freibauer et al. (2024), this has made investing easier for people with lower incomes since transaction fees don’t erode long-term returns.

Beyond costs, investors have gained autonomy and empowerment (Barber & Odean, 2002). Self-directed mobile platforms provide retail investors with 24/7 access, enabling them to monitor their portfolios and execute trades at any time and from anywhere (Liu et al., 2025; Pan et al., 2023). Furthermore, retail investors are granted access to real-time data, charts, and investment news that were previously available only to professional investors (Pan et al., 2023). As these studies see these features as a beneficial for retail investors, it is important to notice that behavioral consequences of these features make results mixed, as discussed in depth in Chapter 3.2.1.

Empirical evidence also suggests that mobile platforms may enhance performance for certain investor segments. Pan et al. (2023) found that risk-averse investors with higher online channel use intensity outperform other risk-preference groups, as they can leverage platform efficiency without overconfident trading behavior. It should be noted that the study does not consider how these investors perform relative to investors who do not join the platform. Freibauer et al.'s (2024) study provides further evidence of this: they documented that the Neobroker platform users achieve higher non-risk-adjusted annual returns than general investors. They found that results are driven by risk tolerance and ownership of riskier financial products, such as derivatives, so the effect of the platform is not the only contributing factor to better performance.

Additionally, Andraszewicz et al. (2023) suggest that open information exchange in platforms may reduce some behavioral biases, such as the disposition effect. Chapkovski et al. (2026) also found that informational gamification features, such as price notifications, can be beneficial for investors with a higher level of financial literacy and accurate market beliefs. This finding supports Pan et al.'s (2023) study, which also suggested that individual factors and the level of financial knowledge influence how digital and mobile platforms affect investors.

Cost-reductions and improved access to inclusive data are well-established and broadly distributed among retail investors (Barber & Odean, 2002; Cen, 2024; Freibauer et al., 2024). Performance and behavioral benefits in turn appear more contingent, concentrated among specific investors such as risk-averse and financially literate investors (Pan et al., 2023; Chapkovski et al., 2026). Notably, several features identified as benefits in this section such as real-time data access, simplified trade execution are the same features associated with behavioral costs documented in Chapters 3.2 and 3.3. This dual nature could suggest that user characteristics and behavioral conditions determine which side dominates.

3.4.2 Behavioral Costs of Mobile Trading

Behavioral costs emerge from the interaction between the app's interface and a possible investor's psychological vulnerabilities. While immediate accessibility was featured as a benefit for investors, it can also encourage reactive, short-term decision making, which has been linked to weaker investment outcomes (Barber & Odean, 2002).

Barber and Odean (2001) and (2002) studied how excessive trading is associated with lower net returns due to transaction costs, poor timing, and overconfidence. Mobile environments may intensify these mechanisms since trading is faster and more frictionless (Liu et al., 2025). Cen (2024) showed that mobile app adoption among Chinese retail investors leads to higher trading activity, as app adopters appear to be highly sensitive to short-term signals. As noted in Chapter 3.3.1, Freibauer et al. (2024) observed similar patterns among the Neobroker users, with more frequent trades (3,83 per month versus 2,53 for general broker users).

Attention-driven trading leads retail investors to buy assets during periods of herding (Barber et al., 2022). The study also found that institutional participants may exploit these predictable price pressures caused by Robinhood investors. In Chapter 3.3.2, the results of this behavior were found to be -4,7% over 20 days, and in extreme cases, these losses caused by attention-driven trading and herding can be close to -20% within a

single month (Barber et al., 2022). Furthermore, they used the Fama-French five-factor model plus momentum factor to examine investor performance and found that herding episodes triggered by app result in daily abnormal returns ranging from -55 to -61 basis points.

Kalda et al. (2021) also found that once investors adopt mobile app trading they start to trade more frequently and with higher risk-level also on other trading platforms. This finding suggests that there is a "spillover effect" that creates a learning process where behavioral biases are internalized. This indicates that the negative impact on decision-making may not be only limited to the mobile device itself. Study also demonstrated that effect of smartphones is not short-lived and transitory, based on data from investor activity from first to tenth quarter.

Cen (2024) found that these behavioral impacts may extend beyond individual retail investor performance to aggregate portfolio outcomes. Findings suggest that "mobile shock" increases investors' sensitivity to short-term market noise, creating a negative spillover for diversified mutual funds. Research indicates that funds with high exposure to mobile trading experience a 2,3% decrease in annualized abnormal returns using the Fama-French three-factor model and the Carhart four-factor model. According to them, liquidity costs cause this decline, harming both app adopters and non-adopters who have chosen the same fund. Regulations and retail-dominated market of Chinese dataset must be considered as a limitation of generalizability of Cen (2024) results.

Grant et al. (2024) findings on "swiping to trade" mechanisms that seem to significantly reduce the "pain of paying" can also be seen as a behavioral factor. This reduction in transactional friction causes investors to focus more on the potential upside of an investment while effectively ignoring its risks. Furthermore, attention-triggered trades have been documented to carry 19 percentage points higher leverage than non-attention trades, according to Arnold et al. (2022).

As this is read alongside the benefits documented in Chapter 3.4.1, this evidence supports the framing study established at the opening: mobile platforms produce real and disproportionately concentrated costs, with the balance for individual investor depending heavily on personal characteristics and behavioral patterns of an investor.

3.5 Synthesis of Empirical Findings and Status of Hypotheses

The literature reviewed in this chapter provides an empirical foundation for evaluating the transition to mobile-based investing environments. Hypotheses for this study were presented in Chapter 1.1; now, these hypotheses will be evaluated using empirical evidence from the literature review.

H_1 was presented as follows: Mobile investment applications have increased retail investors' trading frequency. The evidence strongly supports this hypothesis. Cen (2024) found in their quantitative analysis from Chinese brokerage that smartphone app adoption is associated with a 163% increase in login frequency and a 102% increase in trading volume compared to online platform users. Same kind of findings were made from survey data from German Neobroker users who manually executed 3,83 trades per month compared to 2,53 trades per month made by investors at general online brokers (Freibauer et al., 2024). Although magnitudes differ between Cen (2024) and Freibauer et al. (2024), this variation may be explained by market structure differences, as China's retail-dominated market may amplify aggregate mobile-adoption effects compared to Germany's more institutionally weighted market – overall both studies provide strong directional evidence supporting H_1. Havakhor et al. (2025) quasi-experimental evidence from Yahoo! Finance API shutdown, demonstrated a lowered trading volume by 8,6% - 10,5% which provides a causal link between data availability and trading volume. Hedonic gamification elements, such as achievement badges, featured in mobile applications, were also found to increase trading volume (Chapkovski et al., 2026), though the same study also found that effect is also attributable to self-selection not just design features. The diversity of evidence across geographic contexts (China, Germany, US) and

different methodological approaches (survey data, quasi-experimental, panel-data) supports the robustness of the conclusion.

H_2 was presented as follows: Mobile trading amplifies behavioral biases, particularly overconfidence and attention bias. The incidence of these behavioral biases has been reviewed in the past chapters. Reviewed empirical studies consistently identified behavioral shifts in mobile environments, and the evidence suggests that the amplification of these biases may not be universal but is contingent on platform design and investor characteristics. Therefore, H_2 is supported by several key findings, but it cannot be accepted without acknowledging certain boundary conditions.

Amplification of overconfidence is primarily observed through behavioral proxies such as increased trading frequency and higher risk-taking (Barber & Odean, 2001; Daniel & Hirshleifer, 2015). The reviewed literature indicates that mobile interfaces foster an "illusion of control" and an "illusion of knowledge" by providing frequent feedback and simplifying trade execution (Barber et al., 2022; Cen, 2024; Liu et al., 2025; Havakhor et al., 2025). Grant et al. (2024) had similar findings, as they found that "swiping to trade" function reduces the "pain of paying" making investors consider positive side of the trade more. Freibauer et al. (2024) report that 47% of the Neobroker users view investing as a "casino substitute", though this self-reported attitudinal data may reflect thrill-seeking motivation as much as overconfidence per se. These findings draw on geographically diverse but demographically specific samples, including Robinhood's younger US user base (Barber et al., 2022), Chinese mutual fund investors (Cen, 2024) and German Neobroker users (Freibauer et al., 2024), which limit the strength of universal claim while supporting the directional conclusion across contexts.

Attention bias was shown strongly in Barber et al. (2022) and Wu and Wu (2024) studies, as both studies found that investors on mobile-based applications often focus their investing on stocks that have been featured in "Top-lists" of extreme gainers or losers. Wu and Wu also suggested that this attention-driven behavior may be due to limited screen

estate, as platforms can show only a limited amount of information to investors. However, it must be noted that Kalda et al. (2021) findings indicated that smaller screen size does not drive investors towards more attention trades, since same effect on trading behavior occurred on application regardless of whether it was used on iPhone or iPad. This contradiction could suggest that the mechanism driving attention bias on mobile platforms is not screen size but more likely the broader interface design and notification infrastructure that is characteristic of mobile applications. Arnold et al. (2022) findings on investors' fast reactions to push notifications and Münster et al. (2024) findings suggesting stocks trending on Reddit are associated with higher buying pressure also suggest that attention-driven trading is more pronounced in mobile settings than in traditional environments. Similarly, Reichenbach and Walther (2025) found that the attention allocation of Reddit users is aligned with Cumulative Prospect Theory (CPT). Their findings indicated that up to 50% of all positive posts on major financial subreddits are concentrated on stocks with extreme lottery-like return profiles in the highest decile of CPT values.

Overall, the evidence supports H_2 as a directional claim – mobile trading amplifies overconfidence and attention bias relative to earlier digital environments. The identified boundary conditions in the reviewed literature, including heterogeneity in investor characteristics (Clor-Proell et al., 2020; Chapkovski et al., 2026), some uncertainty about underlying mechanisms (Kalda et al., 2021; Wu & Wu, 2024) and demographic limits, mean that H_2 cannot be supported as a universal claim.

The last hypothesis, H_3 was formulated as follows: Mobile-based trading environments have a significant negative impact on the risk-adjusted portfolio performance of retail investors. After reviewing the literature, H_3 is not supported by the available evidence. Several behavioral findings point in the direction H_3 predicts, but the novelty of the subject means few studies directly test how mobile app adoption affects retail investors' risk adjusted portfolio performance – and the single study addressing this most directly finds no statistically significant effect (Liu et al., 2025).

Certain mobile-driven behaviors are linked to a decrease in investment performance, though none directly tests aggregate portfolio performance for individual mobile investors. Barber et al. (2022) utilized the Fama-French five-factor model plus momentum and found that Robinhood app users have a negative daily abnormal return of -55 to -61 basis points. Similarly, Wu & Wu (2024) demonstrated that top-ranked stocks that attract 9% buy orders systematically underperform lower-ranked stocks in terms of cumulative abnormal returns over the subsequent 30 days. Cen (2024) extends the analysis to fund performance affected by high exposure of mobile app adopters; funds experienced a 2,3% decrease in annualized abnormal returns under Fama-French three-factor and Carhart four-factor models. Kalda et al. (2021) also do not directly measure how returns of investors are affected, instead their evidence also suggests that the shift towards high-volatility and lottery-type investments, is expected to result in lower portfolio efficiency based on established financial theory. Havakhor et al. (2025) study included investors with API access to financial data and they found that these retail investors with high-frequency access to financial data were found to invest more in stock market and they also incurred greater losses and lower returns. Technological access seems to encourage investors to high-volume, “gambling-like” investments driven by illusion of control, precision and knowledge. Comprehensively, these findings consistently point toward worse performance outcomes associated with mobile-driven behavior, but the unit of analysis differs from H_3 specification of individual investors’ risk-adjusted portfolio performance.

The most direct test of H_3 comes from Liu et al. (2025) study that found mobile app adoption does not statistically have a significant effect on portfolio performance when examined as a simple binary indicator. Their findings indicate that the positive impact of reduced transaction frictions is effectively cancelled out by the negative impact of increased trend-chasing. Pan et al. (2023) found that risk preferences need to be considered when analysing portfolio performance of retail investors. According to the study, risk-averse investors may perform better in these environments than risk-seeking investors, who are more prone to behavioral costs. Further confirming the complexity of this

hypothesis, Freibauer et al. (2024) show that the Neobroker users earn higher absolute annual returns (11,36% vs. 6,15%) than traditional online investors. While these results are not risk-adjusted returns and may partly reflect higher risk tolerance among app-users, this finding contradicts the statement of H_3.

The evidence does not support H_3 as formulated. Liu et al. (2025) find no significant effect on investors' risk-adjusted portfolio performance and Freibauer et al. (2024) find higher absolute returns for mobile users. While studies that find negative performance effects (Barber et al., 2022; Cen, 2024; Wu & Wu, 2024) measure abnormal returns at different units of analysis. Therefore, H_3 remains not supported by the reviewed evidence. A more definitive evaluation will require future empirical research that directly tests long-term risk-adjusted portfolio performance among mobile application users.

4 Conclusion

This thesis examined how the shift from online trading to mobile-based applications has affected the trading behavior of retail investors, and whether overconfidence and attention bias are more salient among investors using mobile applications. Study hypotheses proposed that mobile apps increase trading frequency, amplify overconfidence and attention bias, and have a negative impact on the risk-adjusted performance of the investors. The literature review supported H_1 fully and H_2 as a directional claim with certain boundary conditions. H_3 was not supported by the available evidence.

Chapter 2 presented the theoretical framework for this study. The Efficient Market Hypothesis and Modern Portfolio Theory showed how rational investors are assumed to behave. Under the assumptions of these theories, market and information availability and reduction of transaction costs should help investors to achieve better investment performance. In behavioral finance, and in the case of this study, overconfidence and attention bias are presented as counterforces to the rational investor framework. Earlier research has shown that investors are prone to behavioral biases and that online trading in the early 2000s amplified these biases.

The empirical research reviewed in Chapter 3 explored the evolution of the digital investment environments. Transition from stationary desktop platforms to mobile applications has enhanced retail investor participation in the financial markets. Mobile platforms have also shifted investors away from analytical active research towards more reactive trading driven by platform-generated stimuli. Based on the literature, simplified interfaces and omnipresent access can act as a catalyst for existing psychological vulnerabilities such as overconfidence and attention bias. Financial influencers and social media environment appear to function as potential external amplifiers of these psychological vulnerabilities.

The empirical evidence showed that this technological shift has led to a substantial increase in trading frequency among investors. The reduction of transactional frictions and

ubiquitous access has allowed investors to react quicker, but this change comes with a cost of analytical depth. Mobile interface design, including push notifications, “Top movers lists”, finfluencers and simplified information displays, may also reinforce attention bias.

Overall, the literature review revealed a trade-off regarding investor performance. Mobile applications have further democratized financial markets, providing retail investors with more advanced tools and information that were previously reserved for professionals. These improvements coexist with presented behavioral costs. Findings suggest that experience and psychological factors such as risk preferences shape how mobile app adoption alters investment performance – this makes net effects highly conditional rather than uniformly positive or negative.

This study has certain limitations that should be considered. As a literature review, the results of the study rely on secondary data and methodologies of prior researchers. Much of the empirical evidence is focused on specific platforms or geographical regions, which may limit the generalizability of the results. A substantial portion of the reviewed evidence draws from younger and less experienced investor populations, which similarly constrains how broadly conclusions can be applied. Mobile app adoption is also a relatively novel research field, so the long-term impacts on investor performance and wealth accumulation remain unexplored. For future research, long-term studies measuring risk-adjusted portfolio performance among mobile platform users, across diverse demographics and markets, would substantially improve the field’s ability to evaluate whether mobile adoption and its behavioral effects produces net benefits or net costs for retail investors.

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