THE IMPACT OF MOBILE TRADING TECHNOLOGY ON INDIVIDUAL INVESTORS’ TRADING BEHAVIORS: THE "TWO-EDGED SWORD" EFFECT

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Abstract

As the evolution of financial trading technology with wireless network infrastructure, mobile trading technology has emerged to meet investors’ requirements to access the financial markets regardless of time and place. However, being like a “two-edged sword”, mobile trading technology may affect investors’ irrational trading behaviors negatively. This research investigates both the positive and negative effect of mobile trading technology on investors’ behaviors including rational disciplined trading and irrational overtrading. According to the nature of mobile trading technology, this study suggests mobile trading platform improves investors trading perceptions in terms of perceived efficiency and perceived informativeness. Then, the influence of mobile trading platform usage on investors’ disciplined trading is examined. Meanwhile, from the perspectives of behavioral finance and impulse control disorder, the study explores how mobile trading technology impacts investors’ overtrading with the presence of cognitive biases or psychiatric disorder. In the future work, a survey will be conducted to test the hypotheses.

Keywords: Mobile trading technology, Mobile trading platform, Trading behavior, Overtrading, Disciplined trading, Perceived efficiency, Perceived informativeness, Cognitive bias, Pathological gambling.

1 Introduction

Nowadays, owing to the rapid development of mobile technology, proliferation of smart mobile devices and expanded coverage of wireless networks including 3G network and wireless LANs, mobile systems and applications can be used regardless of time and location. The innovative mobile technology have influenced human behavior by bring more freedom (Tenner, 2009). Service providers are trying to better meet users’ requirements by offering mobile supported service, which leads to the booming of a variety of new types of mobile commerce transactions. In the financial service industry, mobile trading technology has been utilized to enable investors to access market data and financial information via mobile devices without restrictions of time and place. Besides, financial service providers have substantially developed mobile trading platforms to enhance customers’ psychological switching costs (Ehrlich, 2004).

Prior IS research has focused on mobile usage of mobile commerce including mobile shopping, mobile banking and mobile payment (Kim et al., 2008; Mallat, 2004; Rajnish et al., 2007; Sheng et al., 2008; Torsten et al., 2009; Valcourt et al., 2005; Xu and Yuan, 2009; Zhou, 2011). The limited research on mobile trading technology mainly compares mobile trading system with traditional trading...
system in terms of investors’ trading behaviors and cognitive patterns (Shih, 2009; Shih, 2010). Even so, relatively less attention has been paid in IS research to the study of investors’ mobile trading behaviors. Moreover, there are still lacks of proposed theoretical explanations and empirical research of mobile trading technology’s “two-edged sword” effect on investors’ trading behaviors, which prevents our deeper understanding of the IS phenomena. This study argues that mobile trading technology increases the trading flexibility for investors to improve disciplined trading performance. Whereas, being like a “two-edged sword”, mobile trading technology may also exhibit negative effect on irrational investors’ trading behaviors.

This research, motivated by the theoretical and practical concerns, aims to build up and empirically test a theoretical model to investigate how the usage of mobile trading services impacts individual investors’ trading behaviors, both positively and negatively, from the perspectives of behavioral finance and impulse control disorder. By analyzing investors’ trading perceptions, cognitive biases and psychiatric disorder during trading process, the research further examines the underlying mechanism of mobile trading technology’s effect on investors’ disciplined trading and overtrading. A survey will be conducted in the next step based on the presented procedure of operationalization and survey administration. Besides, the research findings can also serve as a reference for financial service providers to analyze customer behaviors, to establish appropriate services, and to develop marketing strategies.

2 Theoretical Background

2.1 Trading Behaviors in Financial Markets

In today’s financial markets with volatility and uncertainty, a considerable proportion of investors are inclined to rely on trading plans to manage their trades on the basis of specific objective statistics, such as fundamental indicators (Bernard and Thomas 1990), and technical indicators (Brock et al. 1992). On the contrary, the prior research suggests that certain market anomalies are tied to the presence of irrational trading by investors (Benartzi and Thaler, 1995). Evidence also shows that various populations of investors exhibit irrational trading behavior (Grinblatt and Keloharju, 2000; Odean, 1998). In consideration of the difference between investors’ rational and irrational inclination, we classify investors’ trading behaviors into two categories: disciplined trading and overtrading.

The term “discipline” is generally used by investors to indicate trading plans that minimize potential behavioral biases and effectively control trades. It is beneficial for investors to set strict trading objectives, and to stick to suitable trading plans such as trade entry and exit points, and position sizing. Rational investors tend to believe that disciplined trading, or the avoidance of behavioral biases, is crucial to success (Locke and Mann, 2005). Accordingly, disciplined trading relates to trading behavior without emotional baggage such as overconfidence (Locke and Mann, 2003). From the investors’ perspective, the effective way to manage risk associated with financial trading is to consistently follow a disciplined trading style with reliable trading rules. In this research, disciplined trading refers to the investors’ rational trading behaviors which are dispassionately in line with trading plans, so as to avoid behavioral biases and emotional impulse.

In comparison, rather than follow a disciplined trading style, some investors are more likely to exhibit signs of overtrading under the effect of cognitive biases or emotional impulse. The investors who ignore or do not stick to trading plans attempt to make overtrading decisions compulsively. Deviating from disciplined trading, overtrading highlights real financial risk, and fails to avoid potential losses. Empirical studies have shown that investors appear to overtrade and underperform (Barber and Odean, 2000a; Odean, 1998). In this study, we argue that overtrading typically comes in the form of trading on emotions. Likewise, we define overtrading as the investors’ irrational trading behavior which is
characterized by taking financial trades emotionally when not supported by trading plans. Then, the following sections investigate the mechanism under which mobile trading technology affects investors’ trading behaviors, both positively and negatively.

2.2 Mobile Trading Platform and Investors’ Trading Perceptions

With the embedded support of mobile trading technology, mobile trading platforms offer investors the advantages to access financial markets and trade a variety of financial products on mobile devices without time and location restriction. In this study, mobile trading platform is regarded as mobile applications that provide mobile trading services for investors to access financial exchanges and conduct financial trading transactions via mobile devices such as mobile phones, smart phones, PDAs, tablets and other devices which have adequate configuration to support mobile wireless trading applications. The mobile trading platform usage discussed in this study focuses on investors’ usage ratio of mobile trading platforms in their trading experience.

Informativeness is defined as “the ability to effectively provide relevant information” (Oh and Xu, 2003 p. 681). The majority of the research focuses on relevancy of information considering the context of use, and regards information relevancy as the degree to which information system provides relevant information for users and how easily the system can meet users’ needs and specific situation (Bailey and Pearson, 1983; Chang et al., 2006; Lee and Jun, 2005; Muylle et al., 2004). Likewise, informativeness in this research refers to the ability to offer investors real-time relevant financial information including live price quotes and market news. Particularly, from the investors’ perspective, perceived informativeness is defined as the extent to which investors perceive that they can access real-time relevant financial information to facilitate trading transactions in financial markets.

Efficiency is recognized as one of the system qualities to enable users’ tasks to be performed in quick, effective and economical manner, which includes timeless and resource utilization (ISO/IEC 9126-1:2001, 2001). In detail, system should have ability to deliver requested information within a reasonable response time and to optimize resource utilization considering restrictions of mobile devices such as small memory and low processing resources (Rushinek and Rushinek, 1985). In this study, efficiency refers to delivering and executing investors’ trading orders timely. Perceived efficiency is thus defined as the extent to which investors perceive that their trading orders can be timely delivered and executed in financial markets.

2.3 Behavioral Finance and Cognitive Biases

The behavioral finance research has expanded quickly because of the incompetency of the traditional expected utility maximization of rational investors within the efficient markets framework to explain investors’ irrational decisions. In particular, the theory of behavioral finance suggests that investors bring psychological and behavioral biases to their financial decisions (Barber and Odean, 2000a; Ko and Huang, 2007; Statman, 1995). By combining conventional economics and finance with behavioral and cognitive psychological theory, behavioral finance aims to describe how cognitive biases and social psychological phenomena affect investors’ behaviors both individually and in groups (Baker and Nofsinger, 2010). Under the circumstance of mobile trading technology, we apply the theory of behavioral finance to explain the investors’ irrational actions due to the cognitive biases including overconfidence bias and availability bias.

The overconfidence bias has been viewed as an important factor to analyze investors’ behaviors in financial markets because experimental psychologists show that it exists in many aspects of human behavior (Baker and Nofsinger, 2010; Ko and Huang, 2007). Prior research suggests that the most robust finding in the psychology of judgment may be that people are overconfident (Bondt and Thaler, 1985). A large amount of cognitive psychological surveys and experiments shows that subjects
overestimate both their abilities (Frank, 1935) and the precision of the information they’ve been given (Alpert and Raiffa, 1982; Fischhoff et al., 1977; Lichtenstein and Fischhoff, 1982), such that overconfidence can be basically summarized as “unwarranted faith in one’s intuitive reasoning, judgments, and cognitive abilities” (Pompian, 2011 p. 72). We suggest that overconfidence bias is recognized as investors’ overly optimistic assessment of their investment abilities or the financial information they possess in financial markets.

The availability bias implies that people tend to estimate the probability of events based on how prevalent or familiar the events appear in their lives. Likewise, people are influenced by what can be readily remembered such as vivid or highly-publicized events (Redhead, 2009). In other words, easily recalled or recent events are perceived by people as being more weighted than prospects that are hard to comprehend or imagine when making decisions. Similarly, investors exhibiting availability bias are more likely to judge the likelihood or frequency of occurrences based on readily available information rather than complete or objective information (Ciccotello, 2009; Pompian, 2011). Accordingly, we believe that irrational investors with availability bias tend to make trading decisions and opinions biased toward more recent financial information or easily obtained financial information.

2.4 Impulse Control Disorder and Pathological Gambling

Impulse control disorder is a class of psychiatric disorders characterized by impulsivity which is failure to resist a temptation, urge or impulse that may be harmful (Grant 2008). Considerable literature suggests that pathological gambling includes characteristics of impulse control disorders (Castellani and Rugle, 1995; Davis and Brisset, 1995; Hardoon et al., 2004; Rugle, 1998). We comply with the criteria of pathological gambling in the DSM IV (American Psychiatric Association, 1994), and view pathological gambling within the domain of impulse control disorder, rather than an addiction. Accordingly, the key diagnostic features associated with pathological gambling include: (1) obsessive preoccupation; (2) progressive inability to control gambling; (3) continuation of gambling despite increasing negative consequences (American Psychiatric Association, 1994).

Although investors’ irrational trading behaviors can be mostly explained by introducing psychological biases, there may exist another proportion of irrationality which is induced by psychiatric disorder. This study suggests that irrational trading behavior may bear similarities with pathological gambling. In investment, investors with pathological gambling disorder may engage in irrational trading behavior which is alike the gambling activities during mobile trading transactions. To comprehend the mechanism behind investors’ irrational trading behaviors, we recognize pathological gambling disorder as one of the important predictors of overtrading behaviors. Furthermore, we define pathological gambling disorder as investors’ psychiatric disorder which is characterized by maladaptive and re-current episodes of gambling during financial trading process.

3 Research Model and Hypotheses

The research model is illustrated in Figure 1. The usage of mobile trading platform influences investors’ trading behaviors positively and negatively. On the one hand, facilitated by mobile trading technology, investors enhance their disciplined trading efficiently and effectively. On the other hand, abundant readily abstained financial information may result in investors’ cognitive biases. And then, investors’ biased behavior of overtrading comes into being. Moreover, investors’ irrational trading behaviors may be due to pre-existing pathological gambling disorder which is being aggravated by adopting portable mobile trading platform.
Mobile technology is premised to make people’s life easier, and to improve upon the difficulty of common tasks (Obe and Balogu, 2007). Likewise, mobile trading technology is proposed to provide real-time access to financial markets without constraints. Mobile trading platform has the ability to deliver requested financial information within a reasonable short response time via mobile devices (Rushinek and Rushinek, 1985). To be specific, investors can portably place and execute real-time orders through mobile trading platform to improve the efficiency of trading performance, and they can monitor rich real-time financial information without limitation of time and location. Thus, investors can perceive higher trading efficiency and informativeness in financial markets with support of mobile trading platform. This research proposes that mobile trading platform usage exerts positive effects on investors’ perceptions of trading efficiency and informativeness in financial markets with following hypotheses:

H1: Mobile Trading Platform Usage is positively related to perceived efficiency.

H2: Mobile Trading Platform Usage is positively related to perceived informativeness.

In the rapidly and dramatically changing financial markets, disciplined trading is related to investors’ future success (Locke and Mann, 2003). The rational investors who conduct trading with discipline have high demands to watch market trends and execute trading orders without delay. Besides, immediate access to the fast-changing financial markets can reduce the possibility of losses during investors’ trading process. The rational investors’ requirements to conduct disciplined trading can be fulfilled sufficiently if they access financial markets efficiently and effectively. Likewise, with the perceptions of higher trading efficiency and informativeness in financial markets, the rational investors are encouraged to achieve more financial trading plans. Therefore, the related hypotheses are as follows:

H3: Perceived efficiency is positively related to disciplined trading.

H4: Perceived informativeness is positively related to disciplined trading.

Previous studies have found that people tend to be overconfident (Alpert and Raiffa, 1982; Fischhoff et al., 1977; Frank, 1935; Lichtenstein and Fischhoff, 1982). Investors can easily access an abundance of financial information via various financial trading platforms. However, as the real-time financial information accumulates, part of them also turns to be obsolete or less relevant to current financial
markets. Meanwhile, many investors often overlook the fact that they lack training or experience to filter the deluge of financial information (Pompian, 2011). The precision of financial information may be overstated by the investors who believe them to be more accurately informed than the case. Moreover, the more financial information investors obtain, the more they tend to think they know the trends of financial markets. Thus, informativeness perceived by investors can lead result in their overconfidence bias. We propose that:

**H5: Perceived informativeness is positively related to overconfidence bias.**

With support of information technology, a huge amount of financial information is more easily obtained and swiftly refreshed. Meanwhile, irrational investors are likely to make investment decisions based on readily available information and short-term information without diligent research or verification (Pompian, 2011). More often, if the investors lack the capacity to process the massive quantities of information rationally, the case will be worse. In this case, irrational investors are likely to focus on short-term information, rather than balance between short-term information and long-term information to overcome the availability bias. Thus, investors’ trading perception of informativeness exerts a positive effect on their availability bias, which leads to the following hypothesis:

**H6: Perceived informativeness is positively related to availability bias.**

The view of overconfidence bias is beneficial for explanation of investors’ trading behaviors in financial markets (Baker and Nofsinger, 2010; Odean, 1998). Discussions in financial research suggest that investors’ deviations from disciplined trading plans are often driven by overconfidence (Eining et al., 1997). Investors who are overconfident in their investment abilities attempt to engage in more active trading on emotions (Benos, 1998; Odean, 1998). Overconfident investors hold the belief that they possess special investment abilities and more information than others. Hence, overconfidence bias causes investors to be extremely certain about their own opinions with less consideration of potential risk in financial markets, which increases their emotional trading behaviors (Barber and Odean, 2000b). Therefore, we propose that:

**H7: Overconfidence bias is positively related to overtrading.**

Previous research argues that investors’ financial trading behaviors are subject to availability bias (Barber and Odean, 2000b). The fast-changing financial markets establish a huge plenty of information in short time interval. Investors attribute disproportionate degrees of attention to more recent information or easily obtained information, so that their trading decisions are primarily biased toward dynamic short term events. Accordingly, availability bias causes investors to overreact to current market conditions without rational analysis (Pompian, 2011). Consequently, the investors with availability bias tend to exhibit overtrading irrationally based on short-term financial information. Thus, we hypothesize that:

**H8: Availability bias is positively related to overtrading.**

In addition to the above psychological biases, we suggest that psychiatric disorder may be another explanation for a proportion of irrationality in mobile trading process. In financial markets, investors who fail to overcome tempting impulsive emotions are difficult to stay rational, which hinders them from trading effectively. Benefiting from the portability of mobile devices and timeliness of mobile trading services, irrational investors with pathological gambling disorder may be more easily to indulge themselves in compulsive trading. In this case, there is little difference between gambling and compulsive trading (Elvin, 2006). Therefore, usage of mobile trading platform may increase irrational investors’ pre-existing pathological gambling disorder characterized by obsessive preoccupation, progressive inability to control gambling, or continuation of gambling despite increasing negative consequences (American Psychiatric Association, 1994). Then, driven by pathological gambling disorder, irrational investors have a tendency to overtrading. The related hypotheses are proposed as followings:
H9: Mobile Trading Platform Usage is positively related to pathological gambling disorder.  
H10: Pathological gambling disorder is positively related to overtrading.

4 Research Methodology

In the further step, with regard to investors’ dynamic and complicated trading experience, the survey methodology will be preferred to test the hypotheses. Section 4.1 presents the procedure to operationalize the constructs. Section 4.2 includes the sampling procedure and data collection.

4.1 Operationalization

The measurements of the constructs will be first developed by adapting questions from previous research to enhance validity. For the new constructs, relevant measurements will be elaborated by transferring the definitions of constructs into questionnaire format. For example, according to the concepts discussed above, mobile trading platform usage is further operationalized as investor’s usage ratio of mobile trading platforms in trading experience during last two years; disciplined trading is operationalized as the proportion of investor’s rational financial trades with trading plans in total financial trades during last two years; overtrading is operationalized as the proportion of investor’s financial trades on emotion without trading plans in total financial trades during last two years.

Further, we will create the survey instrument using multiple item method with each item being measured on a seven-point likert scale based on investor’s trading experience and trading perception. Prior to formal data collection process, pre-testing through online questionnaire distributed by e-mail will be done to ensure that the items are unambiguous for the investors.

4.2 Survey Administration

During the procedure of the survey administration, the cross-sectional data is planned to be collected using a self-administered questionnaire. The sample of survey’s targets is set to the individual investors who have prior experience of mobile trading in at least two years. In order to make survey efficiently and effectively, the research will seek assistance from local financial service providers which provide mobile trading services for customers. The financial service providers which assist the research will in turn benefit from the outcomes of the research to further optimize their services. All the respondents will be volunteers, but they will receive a token payment for their participation.

To address the potential threat of common method bias, we will collect data in two stages because measuring different constructs at different times would reduce possibility of common method bias (Ma and Agarwal, 2007; Podsakoff et al., 2003). In our case, investors’ mobile trading platform usage and trading perceptions will be measured two weeks earlier before their cognitive biases, pathological gambling disorder and trading behaviors are measured. Since we target the investors who have more than two years’ experience in mobile trading, we believe that the investors’ perceptions will be likely to remain the same in the two weeks.

5 Theoretical and Practical Implications

This study aims to bridge the research gap on investors’ mobile trading behaviors by proposing a comprehensive research framework to examine both positive and negative effect of mobile trading technology on investors’ trading behaviors with or without rationality, so that investors’ trading behaviors in the mobile trading context could be more wholly understood. Particularly, the research introduces theory of behavioral finance to understand investors’ cognitive biases when making
financial decisions, such as overconfidence bias and availability bias. Based on the inclusion of cognitive biases, the formation of investors’ biased trading behaviors can be further clarified. The idea can be extended to other IS research related to financial behaviors as well. In addition, the study applies the finds of psychiatric disorder to argue another type of investors’ irrationality which can be aggravated by usage of mobile trading platform and further lead to biased trading behaviors. Especially, pathological gambling as an impulse control disorder is emphasized in this research to investigate investors’ overtrading behaviors.

In practical, financial service providers had put effort into developing mobile trading platforms to attract customers. Thus, understanding both the positive effect and negative effect of mobile trading technology on individual investors’ behaviors has practical implications for improving mobile trading service. In this sense, financial service providers are encouraged to improve their trading services upon analyzing investors’ trading perceptions, cognitive biases and psychiatric disorder during their trading process. Accordingly, financial service providers can refer to the research findings for customer behavior analysis, appropriate services establishment and marketing strategies development.

6 Conclusion

This research originally attempts to model the “two-edged sword” effect of mobile trading technology on investors’ trading behaviors from both positive and negative perspectives. To better understand investors’ financial trading behaviors, we classify the relevant behaviors into disciplined trading and overtrading. Based on the features of mobile trading technology, this research suggests that investors’ usage of mobile trading platform influences their trading perceptions including perceived efficiency and perceived informativeness. Accordingly, we investigate the positive influence of mobile trading platform usage on investors’ disciplined trading. By integrating views of behavioral finance and impulse control disorder, this research argues how mobile trading technology impacts irrational trading behaviors of investors with cognitive biases and pathological gambling. In the following step, a survey will be conducted to test the hypotheses according to the planned procedure of operationalization and survey administration.

References


