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Essays on Investor Behavior and Financial Innovation

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Hochschulschriften zur Betriebswirtschaftslehre

Herausgegeben von

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Prof. Dr. Wolfgang Dorow, Europa-Universität Viadrina

Band 154

Zugl.: Diss., Frankfurt (Main), Univ., 2010

Bibliografische Information der Deutschen Nationalbibliothek: Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.d-nb.de abrufbar.

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ISBN 978–3–8316–4011–9

Printed in EC
Herbert Utz Verlag GmbH, München
089–277791–00 · www.utzverlag.de

Summary

This dissertation consists of three research papers on the investment behavior of private investors. The focus of the first paper is the influence of financial advice on the disposition effect, which is the tendency of investors to sell winning investments too early and to hold on to losing investment for too long. The main research question is whether financial advice helps private investors to overcome this investment mistake. The second and the third research paper deal with a financial product innovation. This financial product innovation is called »certificates« in Germany and has grown dramatically over the last decade. Throughout this dissertation, I will refer to these products as structured products instead of »certificates«, because, internationally, the expression »certificates« is used in a different context. Today, structured products make up more than 10 % of private investors' portfolios in Germany. This reflects their significance. Moreover, the proportion of structured products on private investors' portfolios is even expected to grow in the future. The main research question of the second paper is: Does a financial product innovation lead to excessive trading of private investors? Finally, the third research paper deals with the question whether word-of-mouth communication plays a role in the diffusion of a financial product innovation.

The main objective of this dissertation is to add to existing research on investor behavior and financial innovation. The papers build on existing work in these research areas and cover aspects that have not been analyzed so far. I have had the great opportunity to work with a very rich and detailed data set. All research papers are based on the same data set from a major German online broker. The data set covers demographic, portfolio and transactional data of more than 70,000 private investors. Demographic information covers for example age, gender, marital status, profession, and a dummy for financial advice. Monthly portfolio data are available from January 2000 to December 2006 and also includes investment classes and risk classes for the portfolio positions. Finally, the transaction data is available from January 1999 to July 2007 and includes date, exchange and in most cases the total trade fees. This comprehensive data set allows me to analyze various questions and to perform a multitude of robustness checks. Results can also be

challenged with regards to market cycle effects, because the period under observations covers different market cycles.

All above-mentioned papers deal with investment mistakes and irrational behavior of private investors, respectively. These are topics that are located in the research area of behavioral finance. Over the past two decades the field of behavioral finance has grown enormously. Starting with empirical evidence that contradicts traditional finance theory, the work in this field now ranges from empirical studies to theoretical work. Today, the behavioral finance literature is diverse and more and more strands are emerging. Albeit there is no common classification or categorization, the three research papers of this dissertation should be put into the context of existing research. Lately, some authors have come up with a categorization of the behavioral finance literature. None of these categorizations is comprehensive or generally accepted. They should rather be seen as a first attempt to structure the various topics.

Pompian (2006) suggests a differentiation between behavioral finance macro and behavioral finance micro. Each strand of research includes empirical as well as theoretical works. Behavioral finance macro questions the standard theory that markets are efficient. In this field of research, various anomalies that contradict the belief of efficient markets are presented. These can be fundamental anomalies such as differences between value and growth investing, technical anomalies like the fact that past returns can be used to predict future returns, as well as calendar anomalies such as the January effect. Behavioral finance macro comes to the conclusion that markets are inefficient and that it is possible to earn superior returns if investors take advantage of these anomalies. However, other than with traditional finance there is no universal and accepted theory. Some authors have come up with theories that can explain certain aspects of market inefficiency, but there is no accepted theory that can explain all of the observed anomalies.

Behavioral finance micro deals with the individual investor and questions the standard finance assumption that people are rational. Expected utility theory and the notion of the homo economicus are questioned. Researchers in this field present many behavioral biases that contradict fully rational investors. The most prominent examples are the home bias (Coval and Moskowitz (1999)), portfolio underdiversification (Benartzi and Thaler (2001)), excessive trading (Barber and Odean (2000)), the gender bias (Barber and

Odean (2001)), and the disposition effect (Shefrin and Statman (1985)). There also exist attempts to explain these biases. However, as with behavioral finance macro, there is no comprehensive theory that could explain all biases. Probably, the most accepted theory in behavioral finance is the prospect theory by Kahneman and Tversky (1979). Prospect theory states that people are risk-seeking in the domain of losses and risk-averse in the domain of gains.

All papers of this dissertation belong to the behavioral finance micro literature, as they deal with individual investors and certain individual investment mistakes. Building on detailed transaction and portfolio data, the papers analyze aspects of investment timing (»The Disposition Effect in the Presence of Financial Advice«), transaction frequency (»The Impact of a Financial Product Innovation on Private Investors' Trading Behavior«), and portfolio composition (»On the Diffusion of Financial Product Innovations: Word-of-mouth Effects among Retail Investors«).

In a recent overview Subrahmanyam (2007) suggests another categorization of the behavioral finance literature. He defines three major areas of behavioral finance research: (1) empirical and theoretical analyses of patterns in the cross-section of average stock returns, (2) studies on trading activity, and (3) research in corporate finance. Literature in the first area deals with the question why returns vary across stocks for reasons other than risk. Many research papers state that other factors than risk are necessary to explain the cross-section of expected returns. For example, Fama and French (1993) develop a three-factor model that can explain expected returns. Other papers find anomalies in stock returns. Jegadeesh and Titman (1993) present a »momentum anomaly« and evidence of long-term reversal (negative autocorrelation of returns over 3–5 year horizons) is found by De Bondt and Thaler (1985) and De Bondt and Thaler (1987). There are also theoretical papers which try to explain the observed anomalies. A prominent attempt to explain patterns in stock returns comes from Barberis, Shleifer and Vishny (1998), and Hong and Stein (1999).

The second area of behavioral finance literature that Subrahmanyam (2007) suggests is called studies on trading activity. He also presents three sub areas which are (i) patterns in the trades of individual investors, (ii) evidence from derivative markets and (iii) portfolio choice. The first sub area includes literature on the disposition effect. The disposition effect was introduced by Shefrin and Statman (1985). Later, Odean (1998) confirms their results. The

first research paper in this dissertation is an extension to existing literature on the disposition effect. Other papers in area (i) include Odean (1999), who shows a relationship between investors that trade much and a bad trading performance. Barber and Odean (2000) find that trading is hazardous to investors' wealth. They state that investors who trade most earn lower returns than the market. They argue that overconfidence is the reason for excessive trading. The second paper of this dissertation is also about excessive trading. However, instead of focusing on the trading activity of online investors, the paper deals with investor trading behavior after the introduction of a financial product innovation.

Literature in the sub area of (iii) deals with the composition of investors' portfolios and various behavioral biases like under-diversification. Benartzi and Thaler (2001) find that investing follow a simple 1/n strategy. That is they divide their investments evenly across the investments offered. Thus, portfolio diversification depends on the choice offered instead on risk considerations. Goetzmann and Kumar (2007) state that younger and less wealthy private investors hold more under-diversified portfolios. There is also a large body of literature on the preference for local stocks and investments, respectively. Huberman (2001) presents evidence on the home bias, the bias that describes the preference of investors for local, well-known stocks. In a professional context, Coval and Moskowitz (1999) show that mutual fund managers prefer picking stocks headquartered in the region that the managers are based. The third paper of this dissertation can be assigned to sub area (iii). The paper investigates the holdings of investors and finds similarities between the portfolios of investors who live in the same city. There is also a growing number of papers that analyze word-of-mouth communication in a financial market setting (Feng and Seasholes (2004); Hong, Kubik and Stein (2004); Brown, Ivkovic, Smith and Weisbenner (2008)). However, none of these papers touches the question of the diffusion of a financial product innovation.

Finally Subrahmanyam (2007) names »corporate finance« as the third area of behavioral finance research. Much of the literature concerns corporate events. However, the behavioral finance literature in this area also deals with ongoing corporate financial decisions like the payment of dividends or capital budgeting. Furthermore, the area includes psychological aspects of mergers and acquisitions. The topic of overconfidence is also dis-

cussed in the context of corporate finance. Malmendier and Tate (2005) suggest that an overconfident CEO will overinvest in his firm's projects thinking that the latter are better than they actually are.

The categorization of Subrahmanyam (2007) is not complete but he suggests three areas that cover most of the research that exists on behavioral finance. It is therefore a good orientation of where this dissertation is located on the »map of behavioral finance research«.

Besides to the behavioral finance literature, this dissertation also refers to another area of research, which is financial innovation. Frame and White (2004) present an excellent overview of existing empirical research on financial innovation and demand more empirical research in this field. They identify four major areas of research: (1) economic/environmental conditions that encourage innovation, (2) customers for and users of innovation, (3) diffusion, and (4) consequences: profitability and social consequences of financial innovation. The second paper of this dissertation is part of the fourth area. It deals with the consequences of a financial product innovation (structured product) and analyzes risk and return after a financial product innovation has been introduced. The third paper is part of the third research area, because it examines a certain aspect of diffusion, namely the word-of-mouth diffusion.

After the research papers of this dissertation have been put into the context of related areas of research, I will give a more detailed overview of the major research questions, methodological details and findings of the three research papers.

The first paper in this dissertation deals with the question whether financial advice can reduce or eliminate a well-known behavioral bias, the disposition effect. The disposition effect says that investors tend to sell winners too soon and hold on to losers for too long. Shefrin and Statman (1985) were the first to describe this phenomenon and Odean (1998) also showed the disposition effect in another data set by using another methodology. Evidently, the first paper »The Disposition effect in the Presence of Financial Advice« adds to existing literature on the disposition effect. While others like Shapira and Venezia (2001) have already analyzed differences between professionally managed and independent investors, this paper analyzes differences between unadvised and advised investors who still make their own investment decisions. It analyzes the disposition effect in the presence of financial advice.

Although it has been empirically tested that financial sophistication reduces the disposition effect, it has not been analyzed whether financial advisors can help private investors mitigating the disposition bias. The paper hypothesizes that, ultimately, financial advice can help to overcome the disposition effect.

Therefore, the paper analyzes trade data of 22,614 investors of a major German online broker. The standard measure for calculating the disposition effect introduced by Odean (1998) (proportion of gains realized – proportion of losses realized) is used to examine the difference between advised and unadvised investors. The impact of different forms of financial advice is also examined.

The main finding is that financial advisory mitigates the disposition effect. First, advised investors display a significantly lower disposition effect than unadvised investors. Second, before getting financial advice, investors display a stronger disposition effect than after getting financial advice. Financial advisory can therefore possibly enhance the performance of private investors. Differences between different forms of financial advisory are not significant

The results highlight the role of financial advisory for private investors. Nevertheless, even by the help of financial advisors, investors still show the disposition effect. This leaves room for improvement.

The second paper in this dissertation refers to an idea of Odean (1999) and Barber and Odean (2001) and analyzes if a financial product innovation like structured products in Germany is detrimental for investor performance and investor wealth, respectively. The paper hypothesizes that financial innovation is a driver of excessive trading and leads to lower after commission returns. It examines the trade volume of private investors before and after the first transaction of a structured product. It also analyzes investors' returns and risk-adjusted returns before and after the introduction of a financial product innovation. Finally, it describes the characteristics of private investors that are particularly susceptible to excessive trading.

The paper uses the same data set as the first paper. However, only investors who trade structured products are regarded. The paper analyzes trade data of 10,778 investors. To examine the influence of financial innovation on the trading volume and return of investors, an investor-specific event is defined as the first time he trades a certificate. In the following, trade volumes, returns, and risk-adjusted returns before and after the event are analyzed.

As hypothesized, I find that a financial product innovation leads to excessive trading of private investors and thereby reduces their after commission returns. Better risk-adjusted returns do not serve as an explanation for higher trading volumes and higher commissions. Younger, risk-seeking private investors are especially susceptible to »overreacting« to a financial product innovation. The results, however, should not be generalized to society as a whole. The impact of financial product innovation on the welfare of private investors is analyzed. Other groups of society like banks or institutional investors are not considered. Conclusions on the overall effect of financial product innovation on society as a whole should therefore not be drawn.

The results suggest that investors do not automatically benefit from financial product innovations. Excessive trading that apparently comes along with a financial product innovation should be avoided to improve private investors' returns. Financial institutions and online brokers should carefully explain the advantages and possible disadvantages of financial product innovations like certificates.

Finally, the third paper in this dissertation brings together the idea of word-of-mouth communication in financial market settings and the influence of word-of-mouth communication on the diffusion process of innovations. Literature on the first aspect states that word-of-mouth communication plays a role in the decision process of investors. Works by Hong, Kubik and Stein (2005), and Brown, Ivkovic, Smith and Weisbenner (2008) find that neighbors matter in the investment decisions of investors. Literature on the second aspect mostly comes from the field of marketing. The main assertion is that word-of-mouth communication plays an important role in the diffusion process of innovations. In an early work on word-of-mouth effects Rogers (1962) for example states that »the diffusion process consists of (1) a new idea, (2) individual A who knows about the innovation, and (3) individual B who does not yet know about the innovation. The social relationship of A and B has a great deal to say about the conditions under which A will tell B about the innovation and the results of this telling.« Existing empirical research on financial innovation as described by Frame and White (2004) does not touch on the topic of word-of-mouth effects. In the third paper of my dissertation it is hypothesized that investors who live in the same city are more likely to hold the same financial product innovations as their peers.

This is the first effort to deal with word-of-mouth effects in the context of a financial innovation.

Using data on almost 40,000 clients, including structured product investors and non-structured product investors, the aforementioned question is addressed. Structured product investors from the ten largest cities in the data set are analyzed. A regression model is set up, which captures word-of-mouth effects and also tests various samples and other specifications. The main finding is that word-of-mouth is likely to influence the holdings of structured products. Results are robust to several specifications and periods. Robustness checks also suggest that this phenomenon is likely to have an impact on the portfolio risk of private investors. This observation is first documented in the context of financial innovations. The results strengthen previous results and add to existing literature on financial innovation. While this research paper finds word-of-mouth effects with regards to financial innovation, it does not analyze the reasons for and the implications of these word-of-mouth effects. These aspects should be analyzed in future research.

The work on this dissertation, the review of the literature as well as my own empirical analyses have strengthened my belief that traditional finance theory is important and necessary but fails to live up to human behavior. It is my belief that people are far from being rational and are often guided by psychological aspects. In this sense, the field of behavioral finance is necessary to come to a more realistic assessment of finance. It is necessary because it helps to describe and understand human behavior and the consequences that come along with it. It then is easier to avoid detrimental behavior and to help people act more in their interest.

I hope that this dissertation is a valuable contribution to a better understanding of the investment behavior of private investors and serves as a good starting point for future research on this topic.

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