

Department of Finance

Essays on Investor Behavior and Bank Culture

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Essays on Investor Behavior and Bank Culture

Publisher School of Business**Unit** Department of Finance**Series** Aalto University publication series DOCTORAL DISSERTATIONS 62/2020**Field of research** Finance**Date of the defence** 5 May 2020**Language** English **Monograph** **Article dissertation** **Essay dissertation****Abstract**

This dissertation consists of an introduction and three original essays

In the first essay, I examine whether investors revise their beliefs about a stock's risk due to an increase in the stock's volatility. This revision makes loss-averse investors more willing to sell a riskier stock with a paper gain as the likelihood of having to sell it at a loss later increases. An analysis of a large dataset on the holdings and trades of individual investors yields empirical support for this prediction: a one standard deviation increase in volatility is associated with an 11% increase in the disposition effect. The effect primarily emerges from investors' increased propensity to sell stocks with small paper gains.

In the second essay, I show investors exhibit a robust and systematic pattern of shortening their holding period in a stock on which they execute multiple round trip trades. On average, the holding period shortens by 11% with each additional round trip. I show this tendency to be short-termed is associated with reinforcement learning. Investors are more likely to shorten the holding period after a round trip where they could have realized a better return had they sold earlier. Investors become short-termed as they become more familiar with trading a stock.

In the third essay, joint with Matti Keloharju and Deniz Okat, we analyze the effects of banks' "protected-weekend" policies, which aim at improving the work-life balance of junior bankers by guaranteeing them free time during weekends, in particular on Saturdays. We study how these policies affected bankers' working hours, as assessed from taxi rides from bank addresses and their immediate surroundings in New York City. While we find the policies induced bankers to stay at home on Saturdays, we also find they induced them to work more on other days. Our results suggest it is difficult to change bank culture by decree, and that well-meaning policies can have unintended consequences.

Keywords Investor Behavior; Trading Biases; Disposition Effect; Short-termism; Bank Culture; Long-hour Culture

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Ellapulli Vasudevan (Vasu)

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1 Introduction

Each of the three essays in my dissertation uses unique and detailed data to shed light on important questions on investor behavior and bank culture. In the first and the second essay, I use a comprehensive dataset of shareholdings and trades of all Finnish investors which I further complement with data on the investors of a U.S. discount broker. I show that retail investors revise their beliefs about a stock's riskiness and exhibit a higher disposition effect when they observe an increase in the volatility of the stock. Moreover, I find that investors become short-termed when they execute multiple round trip trades on a stock, and argue that this short-termism is associated with reinforcement learning.

In the third essay, co-authored with Matti Keloharju and Deniz Okat, we use data on taxi rides from New York City. Analyzing trips from investment bank addresses to residential buildings we provide insights into investment banks' long-hours culture. Below, I explain the relevance and context of each of these essays in more detail.

1.1 Essays 1 and 2 on investor trading behavior

My first and second essays deal with the behavior of retail investors, in particular, their trading mistakes. In the last two decades, financial economists have documented many investor trading mistakes (Barber and Odean, 2011; Hirshleifer, 2015). However, much remains to be known about the origins of these mistakes. In part, this has to do with the lack of granular data with sufficient time-series observations for a broad cross-section of investors. Finnish data allows me to overcome these issues and contribute to the literature by studying investors' trading mistakes in great detail.

In my first essay, I explore the extent to which investors' beliefs about a stock's risk are associated with the disposition effect – the tendency of investors to sell the stocks that have increased in value and hold on to stocks that have lost value. The disposition effect is widely considered one of the most prominent trading mistakes of retail investors (see Hirshleifer, 2015, for a review).

In particular, I examine whether investors revise their beliefs about a stock's risk

due to an increase in the stock's volatility. I hypothesize that a loss-averse investor will be more willing to sell a stock with a paper gain if she infers that the stock has become riskier. This is because the increase in volatility also increases the likelihood of the stock becoming a loser in the next period. The increase in the tendency to sell a winning stock with increased volatility, therefore, should increase the disposition effect. Analyzing 32 million trades by 300 thousand active investors, I find empirical support for the prediction: on average, a one standard deviation increase in holding-period volatility is associated with an 11% increase in the disposition effect.

Since investors are concerned that winning stocks may become losers if they continue to hold them, the effects of an increase in volatility should be more pronounced when stocks have a small paper gain than a large gain. Intuitively, the smaller the gain, the more likely a stock crosses over to the negative domain due to an increase in the volatility. I find support for this prediction. The effects of volatility increases on the propensity to sell are significantly stronger for small paper gains than for large gains. I also find that the effect of volatility changes is relatively stronger for short-term investors who are more likely to trade at small gains.

My results inform the broader debate in the literature about the origins of the disposition effect. Ben-David and Hirshleifer (2012) argue that speculative trading followed by a belief revision can explain the disposition effect. I provide support to their argument by using volatility changes as a novel proxy for investors' belief revision. My results suggest that changes in volatility may lead investors to revise their beliefs about a stock's riskiness and act to avoid potential losses.

In the second essay, I explore investor short-termism. Policymakers consider the short-termism of investors as an investment mistake (see, e.g., Wehinger, 2011). For the most part, literature categorizes investors as either short-term or long-term based on their characteristics (Barber and Odean, 2011; Hirshleifer, 2015). In my second essay, I show that investors tend to become short-termed on a stock as they become more familiar with trading it.

Studying multiple round trip trades on a stock, I show that Finnish retail investors

exhibit a systematic pattern of shortening their holding period with each additional round trip. On average, the holding period shortens by 11% with each additional round trip. I document a similar pattern in the holding periods of the clients of a large retail brokerage in the US.

I also document that investors tend to lose wealth with their repeated trades, earning a four-factor alpha of -1.3% . At the same time, they exhibit an increase in the disposition effect with repeated round trips. Taking cues from these findings, I explore whether the pattern of shortening the holding period is associated with reinforcement learning, the leading theory of heuristic learning applied to financial decisions (see, e.g., Kaustia and Knüpfer, 2008; Choi et al., 2009; Chiang et al., 2011; Malmendier and Nagel, 2011, 2015). For instance, if the investor missed an opportunity for a better return by holding on to the stock for too long, the negative reinforcement from this missed opportunity could result in investors shortening the holding period on the next round trip.

Supporting the reinforcement-learning hypothesis, I find that investors are more likely to shorten their holding period after a round trip where they missed an opportunity to realize a better return had they sold earlier. Moreover, the propensity to shorten the holding period in a next round trip is monotonically increasing in the magnitude of the missed return opportunity. Overall, my results suggest that reinforcement learning is associated with investor short-termism.

1.2 Essay 3 on the culture in finance

In the third essay, joint with Matti Keloharju and Deniz Okat, we study investment banks' work culture that is notorious for its grueling working hours (Bertrand et al., 2010; Michel, 2011). In particular, we study the impact of policies implemented by investment banks following the tragic demise of a 21-year old investment bank intern who died after working three days without sleep. Following this event, many investment banks implemented "protected-weekend" policies, which aimed at improving the work-life balance of junior bankers by restricting them from working on weekends, in particular on Saturdays. We study how these policies affected bankers' working hours.

The ideal dataset for studying bankers' working hours would be based on the internal registers of investment banks. However, such data is unlikely to be available to researchers. In this study, we circumvent the lack of internal data using a large, publicly available dataset that contains information on 1.1 billion taxi rides in New York City from January 2009 to June 2016. Specifically, we infer the changes in working hours by measuring changes in taxi rides from bank addresses to residential buildings at various hours of the day. We assess the impact of the protected-weekend policy by studying the changes in rides from policy banks with respect to non-policy banks in a difference-in-difference setting.

We show that the policies worked by inducing policy bankers to work less on Saturdays. However, we also find that policy banks exhibit a significant increase in late-night taxi rides on weekdays after the policy. It appears that the policies backfired by inducing bankers to work longer during non-protected days. Moreover, we find that the negative effect of the policy might have had the largest effects on interns, a prime example of the employees the policies were meant to protect in the first place. Our results suggest it is difficult to change the culture of a complex work environment such as that of an investment bank by decree.

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