Before and after: The impact of a real bubble crash on investors' trading behavior in the lab[☆]

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A R T I C L E   I N F O

A B S T R A C T

We report the results of an experiment designed to study whether or not having experienced booms and crashes in naturally occurring asset markets affects subjects' trading behavior in the lab. Active investors in the Shanghai Stock Exchange were recruited to participate in either the Boom treatment, conducted in June 2007 after the Shanghai Stock Exchange had had a bull market for almost 2 years, or the Crash treatment, conducted in August 2008 after the SSE composite index had plummeted almost 60% from its high reached in October 2007. We find that, compared to those in the Crash treatment, subjects in the Boom treatment were much more active when participating in our experimental asset markets in that they tended to made bigger trades and preferred to hold more shares than cash. These behavioral differences cannot be explained by the overconfidence hypothesis.

1. Introduction

When making decisions, individuals tend to make quick inferences that relate the current situation with similar experiences which occurred in the past. These conscious or even subconscious recalls and evaluations not only are disproportionately influenced by peaks and ends of historical events, but also tend to trigger emotions that turn out to play crucial roles in the decision making process (see, for example, Forgas, 1995; Fredrickson, 2000; Isen, 2000; Loewenstein et al., 2001; Nagel and Malmendier, 2011; Schwarz, 1990; Zajonc, 1980).

Recognizing the psychological influence of dramatic historical moments on decision making, this paper investigates whether or not experiencing a market boom vs. a market crash occurred in the naturally occurring world would have different spillover effects on subjects' laboratory trading behavior. Note that there have been a few studies that investigate the behavior of professional traders in controlled laboratory settings (see, for example, Alevy et al., 2007; Haigh and John,

2005, 2010; Smith et al., 1988). Our paper differs from these studies in that we had a unique opportunity to recruit subjects who not only had trading experience from a naturally occurring market but, more importantly, had encountered dramatically different episodes – a market boom vs. a market crash – before they came participate in our study. By doing so, we were able to address the following research question: compared to those who have recently experienced a market boom in the field, do investors who have experienced a market crash trade more conservatively in the lab? We adopted a between-subject design and recruited investors who had been actively participating in the Shanghai Stock Exchange to participate in our laboratory experiment. We conducted our first treatment, called Boom, in June 2007 after the Shanghai Stock Exchange had had a bull market for almost 2 years. The second treatment, called Crash, was conducted in August 2008 after the SSE composite index had plummeted almost 60% from its high. To create similar boom-and-crash market conditions in our laboratory asset markets, we introduced price patterns that were constructed using the weekly data from the Nasdaq and Taiwan Stock Exchanges. Subjects, taking the price information as given, had to decide when and how much (in blocks of 100 shares) they would like to buy or to sell. Finally, a lottery-choice test and an exit survey were conducted at the end of the experiment to elicit subjects' general risk preferences and information such as trading experience in the Shanghai stock market and self-assessment on their relative performance in the experiment.

Based on Nagel and Malmendier (2011) who utilize the data from the Survey of Consumer Finances between 1964 and 2004 and find that birth-cohorts that have experienced high stock market returns report lower risk aversion and have a tendency to invest a higher fraction of liquid wealth in stocks later in their life, we hypothesize that our subjects would behave in the same way in the lab. In other words, not only we expect that field experience would transcend beyond the boundary of naturally occurring markets but, more importantly, we expect that those who have encountered a more depressed market in the field would be less willing to take financial risk even in a laboratory setting that has comparatively less stakes involved.

Several measures are employed to investigate subjects' trading behavior. The first measure is based on decisions made in a lottery-choice task similar to Holt and Laury (2002). The second measure is the number of trades executed in the laboratory asset markets. The third measure concerns the size of an average trade. For this measure, we look at the number of blocks per trade (the absolute size of trade) as well as the percentage of cash used to purchase shares or the percentage of shares sold to obtain cash in one single transaction (the relative size of trade). The fourth measure is the proportion of liquid assets in the form of cash. As a robustness check, we also investigate the percentage of time a given individual holds more than 80% of his liquid assets in shares. Except the first one, all other measures are comparable with most of the risk-taking measures adopted in Nagel and Malmendier (2011).[1]

Results reported in Section 3 support our hypothesis. We find evidence indicating that, after demographic characteristics and years of trading experience in the Shanghai Stock Exchange are being controlled for, subjects in the Crash treatment are more risk averse in the lottery-choice task. Although we do not find them making less trades than those in the Boom treatment, we do find that they have a tendency to make smaller trades, hold a larger proportion of liquid assets in cash, and spend less time holding more than 80% of liquid assets in stocks.

A further data investigation suggests that the above behavioral differences are mainly driven by the behavior of those who can be categorized, ex post, as overconfident or unbiased traders. This result seems to be inconsistent with the finding by Odean (1999) and Barber and Odean (2000) that overconfident traders, defined as those who systematically overestimate the precision of their information and therefore have unrealistic beliefs about their expected trading profits, tend to trade too much. Yet, we argue that, since overconfident traders in our study are defined as those who overestimate their performance ranking in the exit survey, the result that overconfident traders in the Crash treatment tend to trade more conservatively may have more to do with a belief formed based on their field experience that such a trading approach would help reduce their exposure to risks and thus generate more wealth than an average person. While our data do not suggest that the overconfident/unbiased traders in the Crash treatment accumulate significantly more wealth than their underconfident counterparts, they do indicate that, in market N, these traders accumulate more wealth than the same type of traders in the Boom treatment. In other words, the belief suggested above may not be entirely unjustified.

The rest of our paper is organized as follows. Section 2 describes the experimental design and procedures. The results are reported in Section 3, and Section 4 concludes with a brief summary and discussion.

2. The experiment

The experiment consisted of 8 sessions that were conducted at Shanghai Jiao Tong University (SJTU). A total of 103 subjects (72 students and 31 non-students; 49 in 2007 and 54 in 2008) were recruited via SJTU BBS. The average age is 23.9 for students and 40.1 for non-students. Although none of the subjects had any experience in a similar laboratory experiment, they all had been participating in the Shanghai Stock Exchange before coming to our experiment. Specifically, subjects who were recruited in 2007 for the first treatment had an average of 1.36 years of trading experience in the Shanghai Stock

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[1] Nagel and Malmendier (2011) adopt the following four measures of risk-taking: (1) responses to a survey question about individuals' willingness to take financial risk, (2) stock market participation, (3) the proportion of liquid assets invested in stocks or mutual funds, and (4) the proportion of liquidity assets other than stock that are invested in bonds.