

Chapter 1

Introduction

Prior outcome affects feeling, as evidenced by psychological studies, but does it affect decision-making strategy and risk taking in financial markets?

Modern economic theory suggests that investors' decision is not affected by prior outcome. According to traditional models of economic rationality, resources should be allocated, and decisions to invest should only be made when future benefits are greater than future costs. Losses or costs that may have been experienced in the past, but that are not expected to recur in the future, should not form part of the decision calculations. That is that the past cost is sunk. A sunk cost is a cost that has already been incurred, and is not relevant to the present decision. Therefore, the only question at issue is, whether the anticipated return is in accord with the risk one takes. Prior outcomes of financial investments are sunk, are irrelevant, and should not influence one's risk taking behavior.

A competing view states that prior outcome affects decision making. Consider the psychological literature on the sunk cost effect: an individual is induced to be affected by prior outcome when making real decisions. It is well established that real decision makers are often influenced by historical or sunk costs (Thaler (1980), Staw (1976), Staw and Ross (1980), Staw (1981), Arkes and Blumer (1985), Laughhunn and Payne (1984), Arkes, Joyner, and Pezzo (1994).) Sunk costs findings basically show that people always escalate their commitment to the course

of action rather than cut their losses to cease the questionable line of behavior. It appears that individuals tend to stick to a course of action even when it appears that they are committing resources to a losing cause, or throwing away good money (Staw (1976), Staw (1981), Arkes and Blumer (1985).)

Another set of papers investigated the effect of both prior losses and gains on decisions under uncertainty. Laughhunn and Payne (1984) examined the effects of both sunk costs and sunk gains on decisions under uncertainty. Thaler and Johnson (1990) extended their work in the same way. They began by identifying that most people use prior outcomes as a factor in evaluating a current decision under uncertainty. They found that after prior gains, people may take the gambles that they would not typically take, and that after prior losses they reject gambles that they would normally accept. Consequently, people are less averse to risk, following earlier gains and more risk averse after losses. They also suggested the “break-even effect”: people’s risk taking behavior changes when a break-even opportunity is possible. A prior loss does not always cause risk aversion: investors often jump at the chance to make up their losses and increase their risk seeking.

The house money effect is well known in the psychological literature that first asserted and documented experimental evidence by Thaler and Johnson (1990). It refers to a pattern in which people are prone to take more risk when they have just experienced a successful investment. Gamblers refer to this feeling as playing with the house’s money. After a big win, gamblers do not fully regard the new money as their own. Since, gamblers do not fully integrate their winnings with their own

money, they act like they are betting with the casino's money. People are more willing to take risk after a windfall, even when they do not conventionally lean toward taking risks. This is because after a gain, the pain of subsequent loss can be "cancelled" against the feeling of happiness from the prior gain and therefore it appears that people are less risk averse and increase their risk taking.

There is disparate experimental evidence of how prior gains and losses influence risk-taking behavior. Some evidence supports the house money effect (Thaler and Johnson (1990), Battalio, Kagel, and Jiranyakul (1990), Keasy and Moon (1996), Ackert, Charupat, Church, and Deaves (2003)), but some not (Clark (2002)). Barberis, Huang, and Santos (2001) developed a theoretical asset pricing model considering house money effect. They appealed to the experimental evidence, concerning the dynamic features of risk aversion and considered the house money effect in their settings, according to the investor's preference. Their model could explain and exhibit phenomena of both the equity premium and volatility puzzles.

Despite strong psychological foundations and the extensive experimental evidence, little empirical evidence is available to evaluate the relationship between house money and risk taking due to the data constraint. We use a unique and complete data set that records intraday transactions of all investors on the Taiwan Stock Exchange (TSEC) over a five-year period ending in December 1999. Each transaction record contains the exact trade time, trade shares, and trade price of the traders involved. To protect traders' privacy, the TSEC replaced the true names of the traders with distinct codes, which allowed us to distinguish traders by investor

type. The Security Exchange Act of Taiwan requires all orders for stocks to be listed on the TSEC and to match those on the TSEC. And there is no third or fourth market, our data set is complete in the sense that all transactions on stocks listed on the TSEC are included in our data set. The database is, to our knowledge, the first comprehensive data source on trading records of a stock market in the world. As a result, we can test the house money behavior over time and by investor type, which helps to comprehensively uncover the risk taking behavior in financial markets.

The primary goal of this study is to examine this important behavior finance question: Do individual investors exhibit the house money effect? To investigate this issue, we evaluate the relation between prior investment gains and the change of risk taking in individual investors. We seek to extend the literature by investigating a unique and complete data set that provides us with opportunities to study variations in the house money effect over time, across gain sizes, and by investor type, and also to assess the effects of countervailing factors such as the familiarity bias and the reference point effect.

Our results reveal compelling evidence of house money effect for individual investors. We find a strong house money effect and show that individual investors increase their risk taking when they have prior investment gains. Specifically, individual investors tend to buy up trend stocks once they have experienced a prior gain.

To examine whether the above behavior holds when investors face little prior

gain, or should the gain be substantial enough to be perceived as playing with the house's money. We analyze the house money effect by gain size. Consistent with the results of Arkes and Blumer (1985) and Arkes, Joyner, and Pezzo (1994), we find that the house money effect is associated with the size of prior gain and this gain should be substantial enough to be perceived as an unanticipated windfall and as playing with the house's money.

Moreover, we examine whether the timing of the house money is an important factor in decision making. Previous work, Arkes and Blumer (1985) and Gourville and Soman (1998), argued that the sunk cost effect may weaken over time. In the other respect, Kahneman, Knetsch, and Thaler (1990) and Thaler (1980) showed that although a newly obtained asset might initially be viewed as a gain, it would gradually be incorporated into a person's wealth and become a part of the status quo. In the case of an investor selling stocks with gains, we believe that the same type of adjustment occurs. We propose that an investor feels a great pleasure from getting a big gain on stock investments yet gradually adapts to that gain over time and thus manifests in a weaker house money effect. Consistent with the above hypothesis, we find the house money effect is attenuated with time, resulting in a greater willingness to ignore a prior gain and a lesser willingness to increase risk seeking on the later investment decision.

Furthermore, we examine the house money effect over two important issues in behavior finance: familiarity bias and reference point effect. Recent work (e.g., French and Poterba (1991), Later, Baxter and Jermann (1997), Heath and Tversky

(1991), Coval and Moskowitz (1999), Huberman (2001), Grinblatt and Keloharju (2001), and Benartzi (2001)) documented that people diversified their portfolio holdings much less than was suggested by normative models of portfolio choice and allocated too much money to domestic stocks, local companies, and their employers' stocks. They like investing in the stocks they already have or have traded before because they are familiar. Therefore, familiarity affects investment choice and as a result may confound the house money effect. We suggest and show that individual investors' investment choice is driven by familiarity bias which diminishes the strength of the house money effect.

Although prospect theory specifies the shape of the value function around the reference point, it does not specify where people set their reference point. Recent studies (e.g., Shefrin and Statman (1985), Odean (1998), Heisler (1994), Weber and Camerer (1998), Gneezy (1998), Heach, Huddart, and Lang (1999), Huddart and Lang (2003), Core and Guay (2001), Poteshman and Serbin (2003)) suggested and found evidence that people tend to consider the average purchase price and the prior maximum price as their reference point in financial investments. We therefore evaluate the role of reference points associated with the house money effect. The results reveal strong evidence of the house money effect no matter what reference point measures we use. In addition, we find that the maximum stock price is a more prevalent reference point than the purchase price. Investors' reference points adapt over time and the currently-salient reference point is the highest stock price attained some time ago. People focus on extreme events when making investment decisions.

The feeling of happiness arising from the profit over prior high is stronger and the effect of such feeling on risk taking behavior is also strongest.

Our descriptive analysis provides several additional conclusions that are noteworthy:

1. Individual investors exhibit the disposition effect— reluctant to realize losses and more willing to realize gains. They frequently realize small gains and less frequently take large losses, such a behavior may not good for their wealth because their gains (return of gains) is lower than their losses (return of losses).
2. Individual investors hold relatively few stocks. They focus on a small number of stocks with which they are familiar. Both the mean and median in our sample of individuals are below 8 different stocks. And the mode is 1 or 2 different stocks.

This study has several contributions to the literature. For the economics literature, the results shed light on the importance of psychological factors in a significant important economic domain. For the behavior finance literature, we first provide a compelling empirical evidence of house money effect. In addition, we present evidence that individual investors' stock investment is underdiversification. They hold and focus on a small number of stocks with which they are familiar. Reaffirm with previous researches, familiarity affects investment choice. Finally, the results suggest how reference points are set in a dynamic environment for

individual investors. They are most likely to set a reference point based on the maximum stock price that was achieved within the previous month. Reference points are likely set dynamically based on the past stock price series thus they change over time.

The remainder of this article is organized as follows. We review the literature in section 2. Section 3 describes our data and methodology in more detail. Our empirical results are presented in section 4. Section 5 concludes the paper.