Impact of behavioral biases (overconfidence, ambiguity-aversion and loss-aversion) on investment making decision in Tehran Stock Exchange

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Abstract: In stock exchange market, everyday millions of marketable securities are traded. One of the most important issues for investigation and discovery of patterns and rules that govern the market is pricing of marketable securities. Human emotion is one of the most effective factors in financial decisions and also value of securities. Thus, the main purpose of this study was investigating the major behavioral biases (overconfidence, ambiguity-aversion and loss-aversion) in Tehran Stock Exchange. This study was a descriptive and non-experimental research. Population was all traders in Tehran Stock Exchange (stock brokers). The main hypothesis of investigation stated that there is a significant relationship between behavioral biases and investing in stock exchange. Results of this study confirmed it.

Key words: Investing in stock exchange; Overconfidence; Ambiguity-aversion; Loss-aversion

1. Introduction

Behavioral finance is a new paradigm in financial markets, which has recently emerged as a response to the problems faced by modern financial theory. Broadly speaking, it discusses that some financial phenomena are better understood by means of models in which agents are not fully rational (Saidi, 2007: 12). In other words, it discussed what happens if we put aside one or both of the individual rationality principles. In behavioral finance models, agents cannot properly update their ideas. In other models, agents have questionable choices and inconsistent with subjective expected utility. In other words, behavioral finance tries to use modern financial theory by introducing behavioral aspects in decision making process. It deals with individuals and collecting and using methods of information. Behavioral finance seeks to understand and predict the outcomes of systematic financial market in psychological decision making process (Rhnamaye rood poshti et al, 2008: 61)

Furthermore, behavioral finance focuses on application of psychological and economic principles to promote financial decision level. Generally, deviation from the correct and optimal decisions in pricing Stock Exchange is one of the basic and most important problems and it often leads to poor returns for investors. Thus, Identifying factors that lead to incorrect decisions and mentioned deviations, can lead to better decisions. According to the importance of psychology and behavioral finance in financial decisions and pricing of stock exchange, this study investigated major behavioral biases (overconfidence, ambiguity-aversion and loss-aversion) in Tehran Stock Exchange (Ahmad and Hussain, 2001)

1.1. Behavioral finance

According to Taller, behavioral finance is a kind of intellectual finance which claims that some agents in economic are not fully rational.

Alson (2006) stated that behavioral finance seeks to understand and predict results of psychological processes of decision-making. In other words, behavioral finance seeks impact of psychological processes on decision-making. Shefrin stated that behavioral finance is studying of psychology impacts on financial decisions and financial markets. Behavioral finance is a pattern which studies financial markets without traditional paradigm and complete rationality (Bodie et al, 2005).

1.2. Behavioral biases

It seems that most of investment decisions in stock exchange were not rational and were affected by emotions and behavioral biases (Brabazon, 2000: 73). Some of most important investigated biases are stated below.

1.3. Overconfident bias

People are overconfident about their ability to predict and accuracy of their information. Also, they are weak in prediction. In other words, people often think that they are so clever, more that they are. They maintain that they have more accurate information. For example when they read an issue in

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internet, immediately make decision to invest (Chan 2001: 88). For example, they often neglect losses to invest in a company, and then with poor performance of company, they will be surprised or displeased (Espahbodi et al, 2001: 92). Overconfident investors estimate their ability in assessment of company to invest excessively. Thus, they neglect negative signs which state that don't buy or Sell it. Overconfident investors do large transactions because they think that they have especial information (Others don't have) (Griifin and Tversky, 1992: 84).

Experience shows that doing large transactions have poor yields in long-term. Overconfident investors neglect their history of investments. Thus, they possibly estimate the risk of losing capital less than which it is. They risk more than their capacity. Rational investor spends money only for information which increases their compliance. Overconfident investors reduce their compliance by frequent transactions (Jegadeesh et al, 1993).

1.4. Loss-aversion bias

Prospect theory of Kahneman and Tversky in 1979, stated that people make decisions based on the potential value of losses and gains rather than the final outcome. Some studies on loss aversion have created a rule of thumb which states "the possibility of loss as a motivator is on average, twice of possibility of profits". In other words, a loss aversion person wants 2 dollars for one invested dollar at risk. Thus, if a transaction has not twice profit, is not acceptable (Jones 2004).

1.5. Technical description

Loss-aversion forces investors to keep losing investments and do not sell them, in the hope that things get lost once again. On the other hand, it motivates investors to sell their profitable stocks, because they fear lose their profits (Kaestner, 2005).

1.6. Ambiguity-aversion

The difference between risk and ambiguity has been introduced for the first time by Knight (1921) it its book entitled "Risk, Uncertainty and Profit". Risk is a situation that we are not confident of results, but we know its possibility distribution (La porta et al, 1997). The basic form of this test can be a good thing to explain. We have two pots. The first contains 50 red balls and 50 black balls. But, about second pot, we only know it contains red and black balls. Individuals can only choose one pot and pick up a ball. If it is red ball, they give awards. Choosing balls from first pot is risky and from second part is ambiguous. After Ellsberg paradox theory, many attempts were made to suggest decision making functions which have ambiguity problem in it (Lakonishok et al, 1994)

2. Literature review

Rudposhti et al (2008) in an investigation entitled "behavioral finance function in explaining the scientific base for the analysis of stock" found that knowledge of behavioral finance provides a basis to raise accuracy of prediction in Tehran stock exchange (Lee et al, 2000: 33).

Foacan (2010) in an investigation on loss-aversion and ambiguity-aversion found that these biases are agreed by most of capital market participants. In addition, investors never tend to uncertain and ambiguous situations (Melicher et al, 2003: 111).

Bron and Skoboard (2007) in an investigation on behavioral biases referred to overconfident (Park, 2008: 54).

Zayane (2010) in an investigation on behavioral biases in Tunisia stated about inefficiency of skew behavioral finance market and overconfidence too (Prist, 2004: 103)

Shefrin (2000) in an investigation entitled "Witnesses representing bias and changes in market prices of basic values" claimed that bias based on effects allows the market prices to distance from fundamental values (Ross et al, 2005).

3. Methodology

This study was a descriptive-survey and applied research. Questionnaire was used to collect data.

Validity of questionnaire was approved by experts and professors. Cronbach's alpha method was used to measure reliability of questionnaire. Population was all traders in Tehran Stock Exchange (stock brokers). Cochran formula for the finite population was used to determine sample size that was at least 302 buyers of Stock Exchange. Descriptive methods were used such as table of frequency, graphs and etc. Inferential statistics were used such as

- One sample t-test : Check the status of behavioral biases and the level of investment in stock exchange
- Binomial test: To assess the presence or absence of dependent and independent variables used in the study
- Friedman test: To prioritize the relevance of independent variables (behavioral biases) and the dependent variable (investment) in the samples
- One-Way ANOVA test: to check ideas according to demographic variables such as age, experience and etc.

4. Discussion and results

Descriptive results

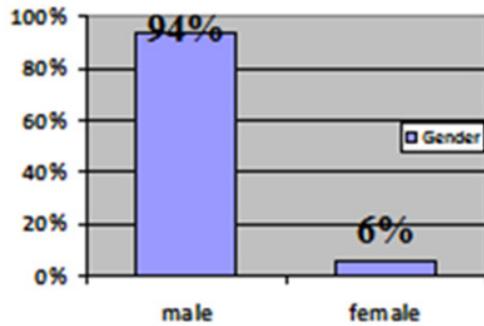According to Fig. 1 94% of respondents were male.

Fig. 1: frequency distribution according to gender

According to Fig. 2, most of respondents had 20-30 years old.

Fig. 3 shows frequency distribution according to years of experience in stock exchange. It can be seen that most of respondent had more than 15 years of experience.
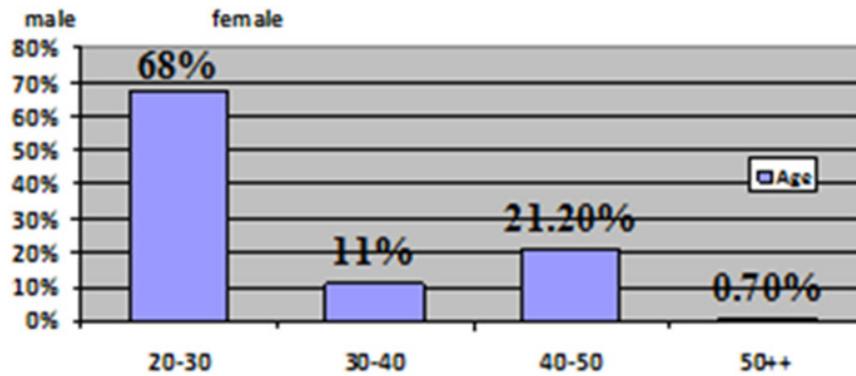

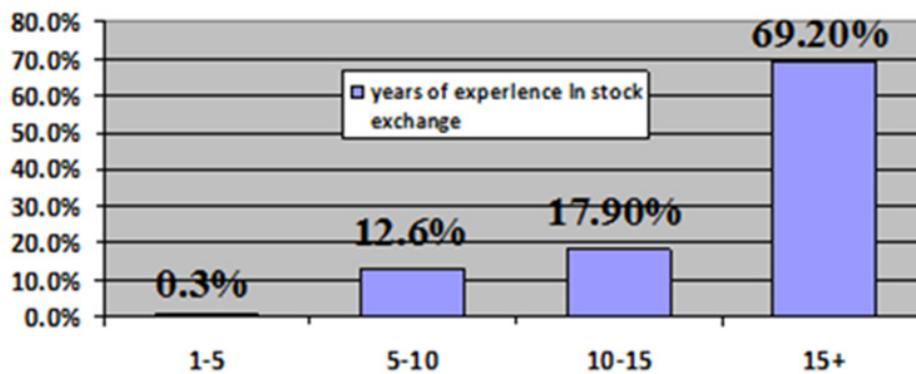**Fig. 2:** frequency distribution according to age

Fig. 3: frequency distribution according to years of experience in stock exchange

Inferential statistics

First sub-hypothesis: There is a significant relationship between overconfidence bias and investing in Tehran stock exchange.

Table 1: Binomial test results

	Grouping	Num	Observed Probability	Probability for test	Sig.
Group 1	3≤	115	0.38	0.5	0.004
Group 2	3>	187	0.62		
Total		303	1		

According to Table 1, sig<0.05, thus null hypothesis was rejected. It means that two groups has significant different. It can be said that 62% of respondents have selected greater than 3. It means that there is a significant relationship between overconfidence bias and investing in Tehran stock exchange.

Second sub-hypothesis: There is a significant relationship between ambiguity-aversion bias and investing in Tehran stock exchange.

According to Table 2, sig<0.05, thus null hypothesis was rejected. It means that two groups

has significant different. It can be said that 57% of respondents have selected greater than 3. It means that there is a significant relationship between ambiguity-aversion bias and investing in Tehran stock exchange.

Third sub-hypothesis: There is a significant relationship between loss-aversion bias and investing in Tehran stock exchange.

Table 2: Binomial test results

	Grouping	Num	Observed Probability	Probability for test	Sig.
Group 1	3≤	130	0.43	0.5	0.018
Group 2	3>	172	0.57		
Total		302	1		

Table 3: Binomial test results

	Grouping	Num	Observed Probability	Probability for test	Sig.
Group 1	3≤	101	0.33	0.5	0.000
Group 2	3>	201	0.67		
Total		302	1		

According to Table 3, sig<0.05, thus null hypothesis was rejected. It means that two groups has significant different. It can be said that 67% of respondents have selected greater than 3. It means that there is a significant relationship between loss-aversion bias and investing in Tehran stock exchange.

The main hypothesis: There is a significant relationship between behavioral bias and investing in Tehran stock exchange.

Table 4: Binomial test results

	Grouping	Num	Observed Probability	Probability for test	Sig.
Group 1	3≤	97	0.32	0.5	0.000
Group 2	3>	205	0.68		
Total		302	1		

According to Table 4, sig<0.05, thus null hypothesis was rejected. It means that two groups has significant different. It can be said that 67% of respondents have selected greater than 3. It means that there is a significant relationship between behavioral bias and investing in Tehran stock exchange.

Conclusion

The first sub-hypothesis was confirmed and was approved that there is a significant relationship between overconfidence bias and investing in Tehran stock exchange. 62% of respondents selected "3" option and greater than "3".

The second sub-hypothesis was confirmed and was approved that there is a significant relationship between ambiguity-aversion bias and investing in Tehran stock exchange. 57% of respondents selected "3" option and greater than "3".

The third sub-hypothesis was confirmed and was approved that there is a significant relationship between loss-aversion bias and investing in Tehran stock exchange. 67% of respondents selected "3" option and greater than "3".

The main hypothesis was confirmed and was approved that there is a significant relationship between behavioral bias and investing in Tehran stock exchange. 68% of respondents selected "3" option and greater than "3".

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