

## Assessing Impacts of Investors' Overconfidence Bias on Investment in Tehran Stock Exchange Market

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### Abstract

Investment refers to translating cash liquidities to one or multiple assets that are maintained for a certain period of time in the future. The word “investment” itself includes a wide range of assets, such as certificates of deposit, bonds, common stocks, and mutual fund investments. The behavioral finance evolution initiated by Kahneman and Tversky (1979) discusses that economic indices and rationales are not the only factors that influence investors' decision makings, but other factors such as behavioral characteristics of the investors also have a role. This study focuses on the behavioral biases. The main objective of this research is to define the behavioral biases, and to explore the impacts of overconfidence bias on investment of investors in Tehran Stock Exchange Market. Our findings indicate that overconfidence bias have a significant impact on investment in Tehran Stock Exchange Market.

**JEL Classification:** G02, G11, G14.

**Key Words:** Behavioral Finance, Investment, Overconfidence.

### 1- Introduction

Channeling savings to national economic entities, implementing facilities for public to contribute to development of productive activities, and sharing those activities' profits are of the main purposes of a stock market (Payam-e-Sarmayeh Gozari, 2004). Hence, stock markets can be significant means to control inflation and increase economic growth rates. Identifying a set of factors that contribute to decision makings, provides an appropriate platform to offer proper services to the investors and implement suitable policies to promote investment (Nourbakhsh, 2000).

Until mid-1980s, capital asset pricing model assumptions (CAPM) that expected a rational individual in an efficient market to choose a range of investments, which maximizes returns and minimizes associated risks, were major pillars for financial studies. Since then, Fama-French three-factor model was introduced to forecast equity prices.

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Over recent decades, scholars noticed that an individual's behavior influences his/her financial decision makings. They believe that investors tend to see future equity values, equity returns, and risk issues in a way other than the ones discussed in modern theories. In fact, a majority of investors might never consider underlying theories, assumptions, and concepts of modern models and investment baskets; and even in some cases, they are not familiar with those issues. Therefore, overstressing on modern theories and models to choose and run an investment seems improper. The scholars believe: i) markets are inefficient, or at least they are less efficient than what they ought to be based on theories, ii) there is a considerable variation across different individuals' investment behaviors to choose an investment basket, and iii) the relationship between risks and returns is not necessarily linear with a positive slope (Eslami Bidgoli and Shahriari, 2007)

Investment in a stock market from the perspective of risks and returns is influenced by numerous factors. Each individual investor comes with a certain level of investment knowledge, interest, and experience that may be affected by various factors, which influence his/her decisions (Reilly and Brown, 2011). One of those factors that influence investors' decisions is their behavioral characteristics (e.g. behavioral biases), which is been studied by financial researchers throughout the last two decades. The results formed an independent branch within financial knowledge, known as "behavioral finance".

If we could prove that particular groups of investors are prone to exhibit certain behavioral biases, then market activist can identify them prior to make investment decisions and most likely reach more suitable outcomes in the investment market (Khalili Araghi and Ghorbani, 2011).

This study aims to introduce and explain those financial biases and explore the impacts of three behavioral biases including overconfidence, loss-aversion, and ambiguity-aversion on the investment of individuals in Tehran Stock Exchange Market over a one-year period. The results could aid investors and people who deal with asset management and economic decisions. Our analysis presents a significant relationship between chosen behavioral biases and investment in Tehran Stock Exchange Market. Moreover, amongst the mentioned biases, investors' decision making processes are highly vulnerable to their overconfidence bias.

The remainder of this study is organized as follows. Section 2 reviews the relevant literature. Section 3 introduces the research methodology applied in this study. Section 4 discusses the findings. Section 5 concludes.

## **2- Literature Review**

### **2-1 Behavioral Finance**

Assumption of rationality of the investors, as a simple model of human beings' behavior, is of the principles of the classical finance knowledge. Almost all classical finance theories, including portfolio theory, efficient capital market, CAPM, agency theory, and other theories, which directly or indirectly were derived from these models, encompass the rationality of investors as an underlying assumption. From the perspective of the behavioral finance, this assumption is not necessarily followed in practice and thus, failed to explain investors' behaviors (Pompian, 2006).

Behavioral finance, as a branch of financial sciences, applies psychological and in some cases sociological sciences to evaluate investors' decision making processes and their responses to different financial market circumstances. This knowledge stresses on social, cultural, economic, personal, and judgmental factors that influence investors' investment decisions.

In a broad classification, behavioral finance knowledge could be assessed in macro and micro levels. The macro level discusses financial markets and their characteristics. The micro level, which is more relevant to this study, questions investors' rationality as a core assumption. The micro level of the behavioral finance discusses that traders in the equity markets are more emotional than rational. Their emotions on future cash flows of equity and the equity's associated risks characterize the traders' behaviors.

The principal assumption in the behavioral finance discusses that investor's decisions are not merely influenced by economic indices and their rationalities, but other factors such as their behavioral characteristics also play a role. These behavioral characteristics are called behavioral biases. Followings describe three types of the behavioral biases.

### ***2-1-1 Overconfidence Bias***

Overconfidence refers to unfounded beliefs of an individual about his/her own cognitive abilities and judgments. It discusses that people often exaggerate, when they talk about their abilities and knowledge. They may not try to sham or even may be unaware of this inner emotion.

Overconfidence might be expressed in a way or another. People tend to avoid investment diversification. They usually prefer to invest in companies that they are familiar with. Hence, investors often purchase equities of local firms or companies they work for. However, the latter can also exhibit one's organizational commitment.

Lewellen *et al.* (1977) in a study titled "Patterns of investing strategy and behavior among individual investors" evaluated the impacts of age, gender, education, and employment on decisions of individual investors. They neglected the rationality as an independent variable and found that other mentioned variables influence an individual investor's decisions. For instance, their findings indicated that comparing to less than 45-years-old investors; over 45-years-old ones fail more to take upcoming recommendations into account. Following the age factor, gender was the second most significant variable. They discussed that women generally emphasize more on comments coming from financial consultants and stay loyal to their chosen consultant for a longer period. Men, on the other hand, pay less attention to consultancy as the only method of financial assistance and replace their chosen financial consultants more frequently. Additionally, number of family members was a significant variable for investors with more than 60-years-old.

Forecasting the possibility of a particular event is often associated with extreme up and downs. When level of uncertainty raises up, experts become more vulnerable to overconfidence. For example, when one predicts an event to happen with 80 percent confidence, its likeliness to take place is less than 60 percent (Hirshleifer, 2001). Overconfidence is also common amongst financial experts and analysts. That is why analysts often resist adjusting their information about a particular company, even if sufficient evidence confirms the necessity of an adjustment (Brabazon, 2000).

An outcome of overconfidence, people often accent on their prior information and become reluctant to change their minds. As a result, they may miss latest information (Fuller, 1998).

Projection phenomenon is also considered as an outcome of overconfidence. Overconfident people tend to attach their failed experiences to others; thereby they could follow their own path with a high level of confidence (Hirshleifer, 2001). Reaching to an inner peace is a reason to have overconfidence. Tendency to projection is also because one might prefer to exonerate him/herself and get rid of inner torments and feeling losses. At the same time, people often have a tendency to appropriate the credits of prior successes. This will magnify the overconfidence. Moreover, individuals usually try to prove themselves and attract admirers. Hence, they may exaggerate their prior successes, which could affect their beliefs and intensify their overconfidence. In fact, overstatement influences the announcer him/herself the most.

## **2-2 Background of Study**

Barber and Odean (2001) evaluated the impacts of gender on overconfidence. Their findings indicated that men, in general, contribute more to equity trades and are more vulnerable to overconfidence. Besides, men have a tendency to consult discounted agencies, which reduces their turnover. In other words, men are often too confident to feel the necessity of consulting agencies. In overall, their article showed that the share of equity trades was 45 percent higher for men than for women. Meanwhile, the difference was more considerable for single individuals than married ones.

Zaiane (2013) assessed the factor of overconfidence in the behaviors of individual investors, trade in Tunisian Stock Exchange Market. Her findings demonstrated that Tunisian investors tend to be overconfident and place a special respect for their own perceptions. They also considered themselves as lucky people, so that only relied on their own gathered information to start transactions.

Knight's PhD dissertation (1921), under the title of "Risk, Uncertainty, and Profit", defined the risk as a kind of gamble with a specified probability distribution. Based on Knight's definition, under an uncertain situation, the distribution of possible outcomes cannot be identified. He, finally, reached to the conclusion that people often resist uncertainties more than risks.

Antoniou, Harris, and Zhang (2013) evaluated the relationship between ambiguity-aversion and association in the equity market. Their findings revealed that an increase in the ambiguity has a significant inverse relationship with equity holder's investment. Therefore, their results supported the fact that limited contribution of investors has a relationship with their ambiguity-aversion.

The article by Thaler and Johnson (1990) discusses that level of an individual's loss-aversion is dependent on his/her profit or loss experiences in former time periods. In other words, a loss after a profit is borne easier than two consecutive losses. Therefore, an identical magnitude of loss, depending on prior loss or profit outcomes, may lead an individual to experience two different emotions. Thereby, people tend to be more loss-averse after facing a loss and they tend to be less loss-averse after obtaining a profit. Such conditions are known as "House Money Effect".

Phuachan (2010) explored the impacts of loss-aversion on investment decisions of employees in Thailand Stock Exchange Market. He showed that loss experiences of the investors magnified their loss-averse biases. Besides, personal factors including age, gender, education level, and investment experiences also affected the investors' loss-averse behaviors.

Talangi (2004) assessed the confrontation of the modern financial theories to that of the behavioral finance. He challenged two core paradigms of the modern financial theory including "rational behavior" and "efficient markets" to merge psychology and economics under the title of "behavioral finance".

Raie and Fallah Pour (2004) introduced the behavioral finance as a distinct approach in financial science and announced that: "the behavioral finance is a paradigm, considering which, models to study financial markets could be developed."

Eslami Bidgoli and Kordlouie (2009) defined the behavioral finance as a stage in between the course of developing standard finance to the neuro-finance. They criticized the incompatibility of standard financial theories with empirical findings and referred the problem to negligence of impacts of the behavioral finance on investors' decisions.

Shahrabadi and Yousefi (2007) made efforts to develop a framework for the behavioral finance science. They explained the foundations and basics of the standard financial theories and discussed the emergence of behavioral and psychological dimensions in the scope of finance and investment.

Badri and Sadeghi (2006) introduced daily irregularities in capital markets as a periodical effect and explored their influences on market turnover and returns. They claimed that market turnover and returns in different weekdays are heterogeneous.

### **3- Research Methodology**

#### **3-1 Research Method and Instruments**

This study from the perspective of research objectives is categorized as an applicative research and from data collection point of view is a descriptive study. A standardized questionnaire is utilized as the research instrument.

#### **3-2 Statistical Population and Sampling Method**

Statistical population of this study contains entire investors in Tehran Stock Exchange Market. To determine the minimum number of required observations, we applied Cochran's formula for limited populations. To select 302 essential observations, simple stochastic approach is utilized. Required data for hypothesis testing purposes is collected through a field study and for theoretical foundations a library method is applied.

Our questionnaire consists of a dimensions including overconfidence bias. Considering the research objectives, hypothesis types, and to facilitate interpretation of findings, Likert's 5 point agree/disagree scale is exerted. Table 1 presents available choices of the scale for each of the questions.

Validity of the questionnaire is evaluated through content validity (face validity) approach. To this aim, the prepared questionnaire is assessed by expert university professors and it is been tried to adjust the contents to the common literature, used in the Iranian National Stock

Exchange Organization. In addition, the questionnaire is pre-examined on a group of 35 investors and then is amended based on comments from expert university professors. To determine consistency of the questionnaire, Cronbach's alpha is estimated through SPSS version 19. Our obtained result for Cronbach's alpha was 0.77, which approves the consistency of the questionnaire.

**Table 1: Applied Choices for Each of Questions**

Choice	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Score	1	2	3	4	5

Source: Adapted from Likert's Scale.

### 3-3 Research Variables

Table 2 exhibits variables applied in this study.

**Table 2: Research Variables**

Independent Variable	Dependent Variable
Investors' Overconfidence Bias	Investment in Tehran Stock Exchange Market

## 4- Data Analysis and Hypothesis Testing

### 4-1 Data Analysis Method

Since this study applies primary data, it is necessary to implement preliminary tests to examine normality of distributions of variable. To this, research variable was evaluated through Kolmogorov-Smirnov normality test. The results rejected the assumption of normality of population and therefore, binomial nonparametric tests were utilized to examine the relationship between investors' Overconfidence bias and their investment in Tehran Stock Exchange Market. Finally, using Friedman's test, investors' behavioral biases were ranked.

### 4-2 Research Hypotheses

Hypotheses of this study are as follows:

*The Primary Hypothesis:* There is a significant relationship between investors' Overconfidence bias and their investment in Tehran Stock Exchange Market.

### 4-3 Evaluation and Analysis of the Hypotheses

Prior to evaluation and examination of hypotheses, normality of distributions of variables is tested.

#### 4-3-1 Normality of the Research Variables

Normality of distributions of the research variables is examined through Kolmogorov-Smirnov test of normality. Table 3 presents the test results over following hypotheses.

$H_0$ : Research variables are normally distributed.

$H_1$ : Research variables are not normally distributed.

**Table 3: Results of Kolmogorov-Smirnov Test on Normality of Distributions of the Research Variables**

	Overconfidence
Observations	302
Mean	3.3402
Standard Deviation	.60524
Absolute	.094
Positive	.094
Negative	-.049
Kolmogorov-Smirnov Z	1.630
Significance Level	.010

As it is shown in table 3, the significance levels for the variable in Kolmogorov-Smirnov tests are less than 0.05. Therefore, the hypotheses (normality of distributions) is rejected for the variable. Hence, to evaluate and examine the research hypothesis, nonparametric tests (binomial tests) are applied.

#### 4-4 Evaluation and Analysis of the Research Hypotheses

Table 4 presents results of the binomial test for the relationship between overconfidence biases of investors and their investment in Tehran Stock Exchange market.

**Table 4: Binomial Test Results for the Relationship between Overconfidence and Investment**

	Criteria	Observations	Observed Probability	Assumed Probability	Significance Level
The 1 <sup>st</sup> Category	$\leq 3$	115	.38	.50	.004
The 2 <sup>nd</sup> Category	$> 3$	187	.62		
Total		302	1.00		

The significance level of the binomial test is less than 0.05. Therefore, we reject the null hypothesis ( $H_0: P \leq 0.5$ ). This rejection implies the fact that the difference between responds with a score less than 3 (1<sup>st</sup> category) and other responds with a score more than 3 (2<sup>nd</sup> category) is more than 50 percent. In fact, the probability of being “agree” or “strongly agree” is 62 percent. Hence, there is adequate evidence to support a meaningful relationship between overconfidence biases of investors and their investment in Tehran Stock Exchange Market.

Table 5 demonstrates Friedman’s rank test results for dimensions contributed to the investors’ overconfidence. According to the Table 5, the significance level of the test is less than 0.05 and therefore there is a meaningful difference between different dimensions of investors’ overconfidence.

**Table 5: Friedman’s Rank Test Results for Investors’ Overconfidence Dimensions**

Factors of Overconfidence Biases	Average Rank	Chi-Squared	Degree of Freedom	Significance Level
b1	5.73	333.947	7	.000
b2	5.60			
b3	3.89			
b4	3.61			
b5	3.62			
b6	3.91			
b7	4.89			
b8	4.75			

## 5 Conclusion

### 5-1 Summary of Findings

The most significant finding of this study on overconfidence bias is that a majority of market activists include their overconfidence bias in their decision making processes.

Based on findings for the overconfidence bias, respondents often believe that comparing to other investors; they earn a high level of returns and have a strong capability to identify active firms in the equity market, which exhibit an above-average performance. This shows that investors tend to overestimate their forecasting abilities and overvalue the accuracy of their obtained information. Mentioned facts are good representatives for overconfidence. Our findings in this regard are in line with what Zaiane (2013) described about Tunisian Stock Market, where the financial market is inefficient and investors tend to be overconfident.

Existence of those biases leads to improper investment decisions in Tehran Stock Exchange Market that eventually drives the stock prices far away from their fundamental value. As a result, the market efficiency may drop below weak (Fama, 1998).

## 5-2 Policy Recommendations

- a. To overcome the problem of investors' overconfidence, policy makers are recommended to provide adequate education opportunities to instruct investment essentials and hazards to active investors in Tehran Stock Exchange Market. As a result, investors can be expected to make rational decisions based upon available information, which reduces hazardous behaviors.

## 5-3 Directions for Future Studies

- a. This study aimed to explore impacts of investors' behavioral biases on their investment in Tehran Stock Exchange Market. Future studies may evaluate the same subject in other Stock Markets in Iran.
- b. Three different types of behavioral biases including overconfidence, ambiguity-aversion and loss-aversion are evaluated in this study. Future studies can contribute to assessment of other behavioral dimensions in Tehran Stock Exchange Market.
- c. Re-evaluation of this study's undertaken subject through other data collection instruments may strengthen available literature.
- d. Future studies can shed light on the impacts of behavioral biases on equity prices, market turnover, etc.
- e. Our findings disclosed that the three studied behavioral biases contribute to the investors' decisions. After implementing required policies to improve the biases, one can explore the effectiveness of those policies to vanish the behavioral biases.

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