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Identifying and Prioritizing the Factors Affecting the Behavioral Noise of Investors (Case Study: Tehran Stock Exchange)



Abstract: - The aim of this research was to identify and prioritize the effective factors of investors' behavioral changes. The research method is applied and correlational. The statistical population includes all stock market investors who were determined by simple random method and Cochran's formula as a sample size of 384 people. To collect data, a questionnaire was used, which was valid with experts' opinions and reliable with alpha. Cronbach's 0.87 was obtained and confirmed. For data analysis, regression test and VIKOR method and SPSS version 25 software were used. The results showed that there is a significant relationship between investors' emotions, investors' personality traits and investors' behavioral stability and their behavioral noises, and the ranking results showed that the first variable of investors' personality traits with a value of (1), the second variable of investors' emotions with a value of (0.840), was the third variable of investors' feelings (0.74) and the fourth variable of investors' behavioral stability was ranked last with a value of (0.594).

Keywords: behavioral variables, financial-behavioral, investors.

I. INTRODUCTION

The behavior of investors is one of the most important and effective discussions of financial science in investment markets. It is obvious that the emotional behavior of investors leads to emotional changes in financial indicators. In this regard, one of the gaps in existing studies is determining the variables affecting the behavioral noises of investors and their correlation. The existing researches, especially the mentioned research in the background section, have investigated the impact of the influencing factors on the behavior or decision-making of investors and have identified their impact (Alanazi RJ 2024). Based on this, the subject innovation of this research is the identification of factors affecting behavioral noises and its technical innovation is the ranking of factors based on the multi-criteria decision-making approach and VIKOR technique. The results of this research can be useful in the decisions of investors and portfolio companies. Therefore, the main goal of this research is to identify and prioritize the effective factors of investors' behavioral changes (Sughaier AA, et al., 2023). Also, identifying the relationship between investors' emotions and their behavioral noises, identifying the relationship between investors' emotions and their behavioral noises, identifying the relationship between investors' personality traits and their behavioral noises, identifying the relationship between investors' state and their behavioral noises are among the other goals of this research.

Research Literature:

Definition of Behavioral Finance:

Behavioral finance is a new paradigm in financial markets, which has recently emerged and is a response to the problems that the modern financial paradigm has faced. In other words, it discusses some financial phenomena in which representatives are not completely rational (Alqara MH, Alqara AH, & AlKhathlan A. 2024). Behavioral finance includes two main areas: arbitrage limitation and cognitive psychology. Limitation in arbitrage deals with under what conditions the arbitrage forces will be effective in the market and under what circumstances they will be ineffective (Hosseini, 2018). Cognitive psychology states that human decision-making processes are influenced by some cognitive limitations, the limitation in its arbitrage includes foresight theory and cognitive psychology includes intuitive behaviors.

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Behavioral science is one of the applied knowledge areas which has entered the field of science in the form of a specialized field called psychology. The foundation of this knowledge is human and his inherent complexities, behavior and personality, which require understanding and recognition in a scientific framework under the title of psychology, which has been studied and investigated (Bahrami, 2018). The historical examination of the knowledge of psychology has revealed the fact that in interaction with other sciences; while providing a practical answer to the problems faced by humans, it has led to the advancement of psychological knowledge on the one hand and has provided a field for interaction with other humanistic on the other hand (Akhmedov MY, et al., 2024). Behavioral finance is a branch of behavioral science that examines financial issues from a wider social scientific perspective, including attention to psychology and sociology, as well as removing mere rational and logical frameworks. On this basis, in the last two decades, many financial discussions have focused on statistical and economic analysis, and with a more open view and using more realistic assumptions regarding modern financial management, they explain the behavior of financial markets (Mohammadi, 2018). The behavioral finance school or point of view that was born from the integration of psychology and finance states that psychology plays a role in financial decision making. Since cognitive errors and deviations affect investment theories, they also affect financial options (Javadi, 2018).

Behavioral finance is the study of how people analyze and interpret information to make informed investment decisions. In other words, behavioral finance seeks to influence psychological processes in decision making. Today, the idea of completely rational behavior of investors who always seek to maximize their utility is not enough to justify the behavior and reaction of the markets (Lascu CF, et al., 2023). Therefore, behavioral finance can be considered a paradigm according to which financial markets are studied using models that discard the two main and limiting assumptions of the traditional paradigm, i.e. maximization of expected utility and complete rationality (Jafari, 2018). In behavioral finance, it is claimed that sometimes; to find an answer to the empirical puzzles in the financial field, it is necessary to accept the possibility that sometimes some economic agents do not behave completely rationally. But according to Robert Olsen (2015), behavioral finance does not try to show that rational behavior is wrong, but it tries to show the application of psychological decision-making processes in recognizing and predicting financial markets (Ueno Y, et al., 2024).

Proponents of behavioral finance firmly believe that the awareness of psychological tendencies in the field of investment is necessary and requires serious development of the field of study, and for those who take for granted the role of psychology in financial knowledge as a factor influencing stock markets and investors' decisions, it is difficult to accept the existence of doubts about the validity of behavioral finance. The success of behavioral finance as an independent academic discipline is due to Professor Daniel Kahneman (2018) and Professor Vernon Smith (2015). In 2015, these two shared the Nobel Prize in Economics. The Nobel Institute appreciated Kahneman for bringing psychological insights into economic sciences, especially paying attention to the judgment and decision-making of people under conditions of uncertainty, and Smith for using laboratory experiments as a tool in economic empirical analyses (Alabdallat NG, et al., 2023).

Behavioral Financial Approaches:

The history of behavioral finance goes back to the early 70s. This combined branch of financial sciences, which actually uses psychology and sometimes sociology for better analysis of financial market issues, often examines the decision-making process of investors and their reaction to different financial market conditions, and its emphasis is more on the influence of personality, culture and judgments of investors on investment decisions (Gour K, et al., 2023). Special cultural structures in Iran and their impact on individual and group behaviors of people, especially in the capital market, make the need to know the theories and analytical and cognitive models of behavioral finance inevitable for the activists and those involved in the market (Jahani, 2018). It is sometimes observed that in the market, instead of two-way demand and having buyers and sellers at the same time, we are faced with one-way demand and queues of buying or simply selling, it is undoubtedly one of the examples of certain behavior patterns that govern the market (Nurmuhambetov IR, et al., 2024). Behavioral finance helps us to better understand our capital market by formulating behavioral models and to solve some bottlenecks caused by behavioral patterns. Presently, various dimensions and approaches in the field of behavioral financial knowledge are discussed as follows:

Behavioral Distortions (Behavioral Biases):

In behavioral finance, behavioral characteristics that are effective on people's decision-making process are studied. These characteristics are called "behavioral distortions". Various studies have been conducted on the types of perceptual errors and how these errors affect the financial decisions of investors in the financial markets, and they have reached the conclusion that the decisions of investors are affected by several errors (Maloku A, et al., 2024).

Among the most prominent researchers in this field were Kahneman and Tversky, who significantly contributed to the development of this knowledge by presenting the theory of expectation; Also, Eder, Weiss, Budescu and Thomas were researchers who played an important role in financial management by presenting articles in the field of behavioral finance and have a huge contribution to help investors in making financial decisions. The sources of behavioral distortions in decision-making are summarized below: (Daryai, 2018)

- 1- Limited rationality and the fact that human beings get confused in cognition.
- 2- People's time limit in short periods of time; they must make many decisions, so there is not enough time for careful consideration.
- 3- Emotional factors affect human judgment.
- 4- Social factors and a person's belonging to the society make him consider some social variables such as paying attention to group decisions.

Talebnia and Takhtai (2014) evaluated the relationship between financial information and the behavior of investors when buying and selling stocks. The findings obtained from the research indicate that there is a significant relationship between financial information and the cost of capital of the company. Behavioral finance researchers and experts have provided different classifications of behavioral trends, which are presented below:

Shahrabadi and Yousefi (2017) presented the following classification for behavioral distortions:

- A) Self-deception or overconfidence: that is, excessive trust in knowledge and abilities.
- B) Innovative methods: a series of rules of thumb or mental rules that will facilitate the decision-making process. Obviously, innovative methods will not always lead to correct decisions.
- C) Social interactions: people tend to agree with others in their decision-making and judgments.

Another classification of behavioral distortions is made by the perspective theory. This theory includes four important parts of investors' behavioral dimensions that were completed during the 80s by scientists such as Thaler, Shiller, and Johnson: A) Loss avoidance B) mental accounting C) Self-control D) Regret avoidance (Mohammadi 2018).

II. RESEARCH METHOD:

The present research will first test the correlation between the research variables, and if there is a correlation between the research variables, we will perform multiple regression estimation. On the other hand, the current research is descriptive, that is, it is based on the analysis of the collected data. Also, this research is a type of library study and causal analysis. The research period is the first six months in 2022. The geographical area of the current research is the stock exchange of Tehran province. The subject area of research is in the field of finance, behavior and investment. The statistical population includes all the investors of the stock market. For sampling in this research, considering the unlimited statistical population, we used Cochran's formula at the error level of 0.05, and the sample size was 384 people. In this research, to collect data from field methods to collect the required information by referring to experts and the library to collect information related to theoretical foundations, literature and research background, which by referring to books, dissertations, internal and external articles and databases has been used.

In this research, a questionnaire was used to collect the data needed to measure the investigated variables. The first part of the questionnaire contains demographic questions about gender, age, marital status, level of education, etc. It should be noted that the personal characteristics of the respondents have been considered in consultation with the supervisors and advisors and it is not intended to prove the hypothesis, but rather to obtain additional findings. And the second part includes the criteria and dimensions associated with each criterion to investigate the research hypotheses, which are extracted from the literature and research background. The scoring method of each criterion is designed based on a 5-point Likert scale. VIKOR is a compromise method and helps to make decisions about options based on different criteria that are used in this paper. Compromise solution means the closest justified solution to the ideal solution. The word compromise refers to a mutual agreement. The VIKOR method prioritizes or ranks options by evaluating options based on criteria. In this method, the criteria are not weighted, but the criteria are evaluated through other methods. Then the options are evaluated and ranked based on the criteria and by combining the value of the criteria. In this method, there are always several different options, which are evaluated independently based on several criteria. Finally, options are ranked based on value.

Data Analysis:

Examining Demographic Characteristics:

In this section, we will examine the demographic information related to the statistical population.

Gender of the Respondents:

First, we examine the gender of the respondents, the results of which are presented in table and chart 4-1.

Table 4-1: Gender of respondents

Gender	Number	Abundance Percentage
Female	89	24%
Male	295	76%
Total	384	100%

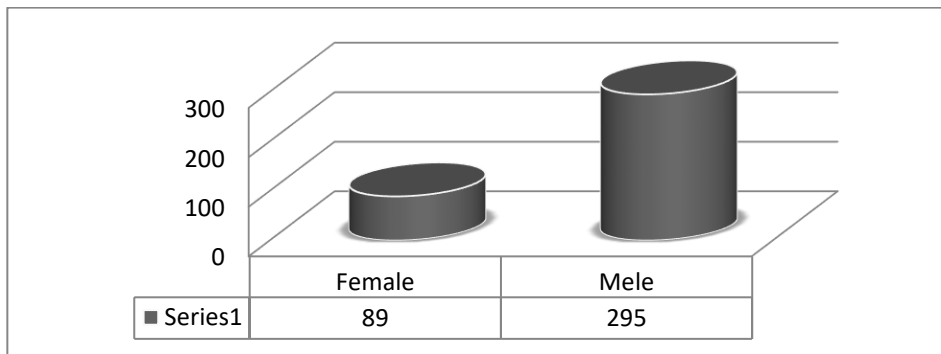


Chart 4-1: Gender of respondents

According to the results of the above table and chart, it can be said that 89 people are women and 295 people are men, which have a frequency of 0.24 and 0.76, respectively.

Respondents' Academic Degree:

In this section, we examine the respondents' degree, and the results are presented in table and chart 4-2.

Table 4-2: Respondents' academic degree

Academic Degree	Number	Abundance Percentage
Associate degree	66	17%
Bachelor's Degree	197	51%
Master's Degree	118	30%
Doctorate	3	2%
Total	384	100%

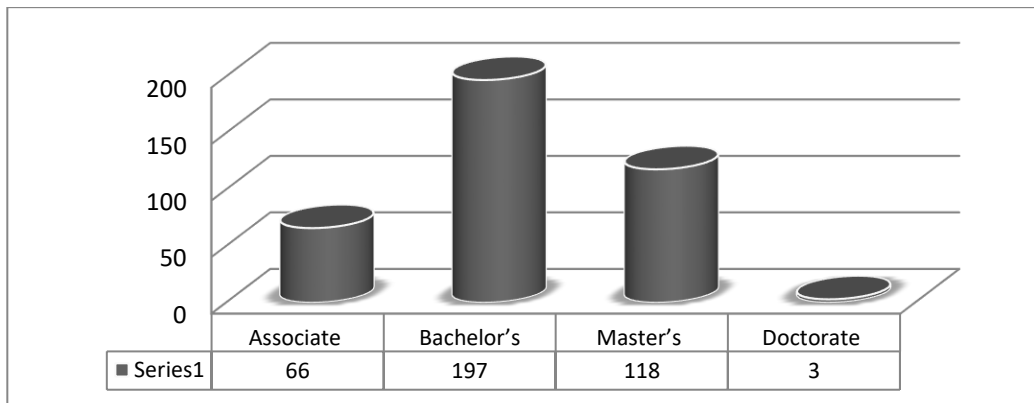


Chart 4-2: Respondents' academic degree

According to the table and graph above, it can be said that 66 people have post-graduate degrees, 197 people have bachelor's degrees, 118 people have master's degrees, and 3 people have doctorate degrees, which have a frequency of 0.17, 0.51, 0.30, and 0.02, respectively.

Age of the Respondents:

In this section, we will examine the age of the respondents, the results of which are presented in table and chart 4-3.

Table 4-3: Age of the respondents

Age of the Respondents	Number	Abundance Percentage
25-20	87	22%
30-26	151	40%
35-31	63	17%
More than 35 years	83	21%
Total	384	100%

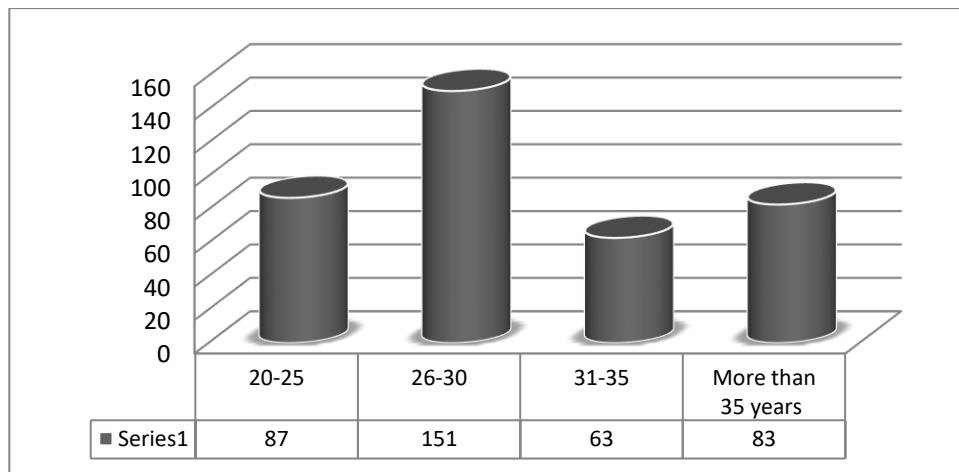


Chart 4-3: Age of the respondents

According to the table and chart above, it can be said that 87 people are between 20 and 25, 151 people are between 26 and 30, 63 people are between 31 and 35 and 83 people are over 35 years old, which respectively have a frequency of 0.22 and 0.40, 0.17 and 0.21.

Marital Status of the Respondents:

In this part, we examine the marital status of the respondents, and the results are presented in table and graph 4-4.

Table 4-4: Marital Status of the Respondents

Marital Status of the Respondents	Number	Abundance Percentage
Single	293	63%
Married	91	37%
Total	384	100%

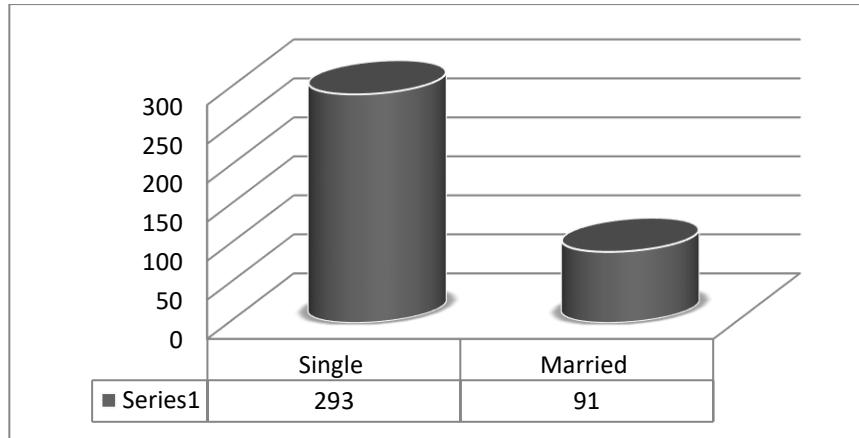


Chart 4-4: Marital Status of the Respondents

According to the above table and chart, it can be stated that 293 people are single and 91 people are married, which have a frequency of 0.63 and 0.37, respectively.

Descriptive Findings of the Variables:

In this part of the fourth chapter, the descriptive statistics of the research variables will be examined, which include statistical indicators of average, standard deviation, etc., the results of which are given in the table below. Based on the data listed in Table 4-5, it is clear that 384 correct data have been collected about the research variables. The average scores of the variables were between 3.5710 and 4.7860, which does not cause any problem considering that this average is also higher than the cut-off point of the spectrum. The above results show that all the averages of the variables are higher than the cut point of the 5-point Likert spectrum (2.5) and the respondents have answered the research questions in line with the research objectives and the data are scattered around the mean with a proportional standard deviation.

Table 4-5: Descriptive findings of the variables

Variables	Minimum	Maximum	Mean	Standard deviation
Investor sentiment	2	5	7860.4	0.8747
Investors' emotions	2	5	5710.3	0.79962
Personality characteristics of investors	4	5	322.4	0.9348
Behavioral stability of investors	3	5	893.3	0.7833
Behavioral noises	3	5	342.4	0.7643

The Normality Test of Variables:

When using the regression method, the normality of the residual sentences in the fitted model is very important. One of the tests that test the normality of residual sentences is the Jarque-Bera test. Therefore, in this test, the following assumptions are formulated.

H0: The residual sentences have a normal distribution

H1: Residual sentences do not have a normal distribution

If the calculated values of the Jarque-Bera statistic (J-B) are not greater than the critical value of the chi-square table, the normality of the distribution of residual sentences is not rejected. But when the sample size is large enough and other classical assumptions are also maintained, the deviation from the assumption of normality is usually insignificant and its consequences are insignificant.

To check the normality of the variables, Jarque-Bera test was used. In this test, the null hypothesis is based on normality, and if a probability greater than 5% is obtained, the null hypothesis is confirmed with a probability of 95%

confidence. Jarque–Bera 's statistic, having the Chi-squared distribution with two degrees of freedom, has examined the hypotheses H0: the distribution is normal and H1: the distribution is not normal. According to this statistic, the null hypothesis is not rejected for all variables and as a result their distribution is normal.

Table 4-6: Data normality test. Jarque-Bera

Variables	Statistic	Significance Level
Investor sentiment	21.444	0.938
Investors' emotions	14.565	0.454
Personality characteristics of investors	25.676	0.676
Behavioral stability of investors	24.656	0.324
Behavioral noises	23.452	0.656

The Results of the Heterogeneity Variance Test:

Brosh-Pagan test is used to test the variance of heterogeneity in linear regression models (presented in the third chapter) and examines the dependence of the variance of the residual sentences obtained from linear regression on the values of the explanatory variables of the model. This test is one of the simplest tests used in this field and was introduced by Brosh and Pagan in 1979. Examining the results of the heterogeneity of variance test of the regression models of the research showed that at the error level of 5%, the significance level of the F statistic of the Brush-Pagan-Godfrey test is less than 0.05 and it is significant

and considering that the values of the F statistic obtained from the model are larger than the corresponding values of the table statistic; Therefore, the H0 hypothesis based on the homogeneity of the variance of the error sentences was rejected; Therefore, the regression model of the research has heterogeneity of variance.

Table 4-7: Heterogeneity variance test. Brush-pagan

Variables	Statistic	Significance Level
Investor sentiment	13.334	0.000
Investors' emotions	21.334	0.000
Personality characteristics of investors	21.324	0.000
Behavioral stability of investors	33.434	0.000
Behavioral noises	32.365	0.000

Collinearity Test:

In linear regression models, one of the methods of estimating model parameters is the least squares method. One of the issues and problems that can challenge this method is the existence of a phenomenon called collinearity. One of the ways to detect the presence of collinearity, which is widely used, is to use the variance inflation factor. This factor shows how much the variance of the estimated coefficients is inflated compared to the case where the estimated variables are not linearly correlated. In statistics, the inflation factor evaluates the variance of the intensity of multiple collinearities in ordinary least squares regression analysis. In fact, an index is introduced that states how much of the changes related to the estimated coefficients have increased due to collinearity (Dewi BS, & Surini S. 2024). The severity of multiple collinearities can be analyzed by examining the magnitude of the VIF value. If the VIF test statistic is close to one, it indicates the absence of collinearity. As an empirical rule, if the VIF value is greater than 5, the multiple collinearities are high (note that in some cases, the number 10 is also introduced as a threshold). According to the results of the variance inflation factor collinearity test in Table 4-4, the value of the VIF statistic is close to 1, so the assumption of variance inflation factor non-collinearity is confirmed (Sedghiani, 2011).

Table 4-8: Collinearity test

Variables	Deviation	Variance
Investor sentiment	0.0934	1.923
Investors' emotions	0.0945	1.023
Personality characteristics of investors	0.0854	1.045
Behavioral stability of investors	0.0982	1.046
Behavioral noises	0.0943	1.022

Examining Research Hypotheses:

First hypothesis: There is a significant relationship between investors' emotions and their behavioral noises.

F test: As seen in the table (Table 4-9), the value of the F statistic and the level of significance related to this statistic indicate that the statistical null hypothesis, which is the meaninglessness of the entire model (all coefficients being zero), is rejected, and the estimated regression model is significant in general.

R²: In this model, the coefficient of determination equal to 0.2098 means 20.98% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of investors' feelings. Also, the regression results (R) show that there is a positive correlation of (0.2981) between investors' emotions and their behavioral noises.²

test t = results show that at the confidence level of 0.95, the t values for all variables are in the zone of rejecting the null hypothesis, that is, they are significant among the variables mentioned in the model. Therefore, there is a significant relationship between investors' feelings and their behavioral noises.

Table 4-9: Test of the first hypothesis

Variables	Variable coefficient	Value of coefficient	Statistics	Standard deviation	Significance Level
Fixed coefficient	7.877	0.99834	12.3974	2.0833	0.000
Investor sentiment	0.298154	0.19872	13.6544	1.10984	0.000
Coefficient of determination	0.20981	F Statistic		14.54	
Adjusted coefficient of determination	0.10892	Significance (P-Value)		0.000	
Regression standard deviation	0.18				
Camera statistics – Watson			2.13		

Second hypothesis: There is a significant relationship between investors' emotions and their behavioral noises.

F test: As seen in the table (Table 4-10), the value of the F statistic and the level of significance related to this statistic indicate that the statistical null hypothesis, which is the meaninglessness of the entire model (all coefficients being zero), is rejected, and the estimated regression model is significant in general.

R²: In this model, the coefficient of determination equal to 0.3564, that is, 35.64% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of investors' emotions, and the regression results (R) show that there is a positive correlation between investors' emotions and their behavioral noises (0.356).

Test t= results show that at the confidence level of 0.95, the t values for all variables are in the zone of rejecting the null hypothesis, which means that the components of the mentioned variables in the model are significant. Therefore, there is a significant relationship between investors' emotions and their behavioral noises.

² Variance Inflation Factor

Table 4-10: Test of the second hypothesis

Variables	Variable coefficient	Value of coefficient	Statistics	Standard deviation	Significance Level
Fixed coefficient	8.78666	0.167655	13.5865	1.08233	0.001
Investor sentiment	0.165666	0.275888	17.7677	2.10832	0.000
Coefficient of determination	0.35644	F Statistic		15.67	
Adjusted coefficient of determination	0.16755	Significance (p-value)		0.003	
Regression standard deviation	0.27				
Camera statistics – Watson			2.19		

The third hypothesis: There is a significant relationship between the personality characteristics of investors and their behavioral noises.

F test: As seen in the table (Table 4-11), the value of the F statistic and the level of significance related to this statistic indicate that the statistical null hypothesis, which is the meaningfulness of the entire model (all coefficients being zero), is rejected, and the estimated regression model is significant in general.

R2: In this model, the coefficient of determination equal to 0.4512, i.e. 45.12% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of the investors' personality characteristics, and the regression results (R) show that there is a positive correlation between the personality traits of investors and their behavioral noises, respectively (0.287).

t-test: The results show that at the confidence level of 0.95, the t-values for all variables are in the zone of rejecting the null hypothesis, that is, they are significant among the variables mentioned in the model. Therefore, there is a significant relationship between the personality characteristics of investors and their behavioral noises.

Table 4-11: Test of the third hypothesis

Variables	Variable coefficient	Value of coefficient	Statistics	Standard deviation	Significance Level
Fixed coefficient	8.38762	0.276122	13.1544	1.16555	0.000
Investor sentiment	0.287122	0.21872	16.7677	2.121311	0.001
Coefficient of determination	0.45412	F Statistic		15.44	
Adjusted coefficient of determination	0.27612	Significance (P-Value)		0.001	
Regression standard deviation	0.55				
Camera statistics – Watson				2.55	

Fourth hypothesis: There is a significant relationship between the behavioral stability of investors and their behavioral noises.

F test: As seen in the table (Table 4-12), the value of the F statistic and the level of significance related to this statistic indicate that the statistical null hypothesis, which is the meaningfulness of the entire model (all coefficients being zero), is rejected, and the estimated regression model is significant in general.

R2: In this model, the coefficient of determination equal to 0.3154, that is, 31.54% of the changes in the dependent variable of behavioral noises can be explained by the variable of behavioral stability of investors, and the regression results (R) show that there is a positive correlation between investors' behavioral stability and their behavioral noises, respectively (0.286).

t-test: the results show that at the confidence level of 0.95, the t-values for all variables are in the zone of rejecting the null hypothesis, that is, they are significant among the variables mentioned in the model. Therefore, there is a significant relationship between the behavioral stability of investors and their behavioral noises.

Table 4-12: Test of the fourth hypothesis

Variables	Variable coefficient	Value of coefficient	Statistics	Standard deviation	Significance Level
Fixed coefficient	7.15443	0.286133	13.1655	1.641211	0.000
Investor sentiment	0.286122	0.154545	12.5455	2.156655	0.000
Coefficient of determination	0.31542	F Statistic		21.67	
Adjusted coefficient of determination	0.36776	Significance (P-Value)		0.000	
Regression standard deviation	0.67				
Camera statistics – Watson				2.67	

VIKOR Rating:

Next, to analyze the data, first the score of each of the respondents to the questionnaire was calculated and then the average scores of the respondents for each of the options in relation to the indicators were calculated; The obtained numbers are included in the matrix under the title of decision matrix (Table 4-13).

Table 4-13: The score of each of the desired variables

Indicators Variable	Investor sentiment	Investors' emotions	Personality characteristics of investors	Behavioral stability of investors	Behavioral noises
Investor sentiment	4	1.23	2.91	4.33	3
Investors' emotions	3.24	3.44	4.39	2	4.98
Personality characteristics of investors	4.55	4.59	4	4.67	4
Behavioral stability of investors	5	3.22	2.98	5	5
Behavioral noises	3.11	2.47	4	3.29	1.25

In the following, the Shannon Entropy Method was used to weigh each of the desired indicators, and the results are as described in Table 4-14.

Table 4-14: The score of each of the desired variables

Investor sentiment	Investors' emotions	Personality characteristics of investors	Behavioral stability of investors	Behavioral noises
0.59	0.150	0.155	0.216	0.223

After calculating the weights of the indicators, the best and worst values for different indicators are shown in Table 4 from the initial decision matrix.

Table 4-15: Best and worst value for indicators

Behavioral noises	Investor sentiment	Investors' emotions	Personality characteristics of investors	Behavioral stability of investors	Behavioral noises
F ⁺	5	4.59	4.39	5	5
F ⁻	3.11	1.23	2.91	2	1.25

After determining the best and worst values for each index, s_j and R_j were calculated, which are respectively the desirability index (S) and the dissatisfaction index (R). Which were calculated from the following equation whose values are given in Table 4-16;

4-1

$$s_j = \sum_{i=1}^n w_i \cdot \frac{f_i^* - f_{ij}}{f_i^* - f_i^-} ; \quad R_j = \max_i \left[w_i \cdot \frac{f_i^* - f_{ij}}{f_i^* - f_i^-} \right]$$

f_i^* : The largest number of the weighted normal matrix for each column

f_{ij} : The desired option number for each criterion in the weighted normal matrix

f_i^- : The smallest number of weighted normal matrix for each column

Table 4-16: Results of S-R values for options

Variables	S	R
Investor sentiment	0.355	0.125
Investors' emotions	0.489	0.185
Personality characteristics of investors	0.445	0.211
Behavioral stability of investors	0.193	0.180
Behavioral noises	0.573	0.213
Best values	0.573	0.213
Worst values	0.139	0.125

In the following, according to the constant value of $V=0.5$, the ranking of the desired variables was done, which is described in Table 4, and some calculations are as follows:

- $Q1 = 0.5 * 0.355 - 0.193 / 0.573 - 0.193 + 0.5 * 0.125 - 0.125 / 0.213 - 0.125 = 0.460$
- $Q2 = 0.5 * 0.489 - 0.193 / 0.573 - 0.193 + 0.5 * 0.185 - 0.125 / 0.213 - 0.125 = 0.740$
- $Q3 = 0.5 * 0.445 - 0.193 / 0.573 - 0.193 + 0.5 * 0.211 - 0.125 / 0.213 - 0.125 = -0.840$
- $Q4 = 0.5 * 0.193 - 0.193 / 0.573 - 0.193 + 0.5 * 0.180 - 0.125 / 0.213 - 0.125 = 0.320$

Table 4-17: Ranking variables

Variables	Amount Q	Score
Investor sentiment	0.740	3
Investors' emotions	0.840	2
Personality characteristics of investors	1	1
Behavioral stability of investors	0.594	4

According to Table 4-17, it can be said that the first variable of investors' personality characteristics was with a value of (1), the second variable of investors' emotions was with a value of (0.840), and the third variable of investors' emotions was (0.74), and the fourth variable of investors' behavioral stability is ranked last with a value of (0.594).

III.DISCUSSION AND CONCLUSION:

Regarding the first hypothesis, the coefficient of determination equal to 0.2098 means 20.98% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of investors' emotions. Also, the regression results (R) show that there is a positive correlation of (0.2981) between investors' emotions and their behavioral noises. Therefore, there is a significant relationship between investors' feelings and their behavioral noises. The results of this hypothesis are consistent with the research results of Lari Semnani (2018) and Norouz Abadi et al. (2015).

Regarding the second hypothesis, the coefficient of determination equal to 0.3564, that is, 35.64% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of investors' emotions, and the regression results (R) show that there is a positive correlation between investors' emotions and their behavioral noises, respectively (0.356). Therefore, there is a significant relationship between investors' emotions and their behavioral noises. The results of this hypothesis are consistent with the research results of Shu (2010) and Bozcourt (2016).

Regarding the third hypothesis, the coefficient of determination is equal to 0.4512, that is, 45.12% of the changes in the dependent variable of behavioral noises can be explained by the independent variable of the investors' personality characteristics, and the regression results (R) show that there is a positive correlation between the personality traits of investors and their behavioral noises, respectively (0.287). Therefore, there is a significant relationship between the personality characteristics of investors and their behavioral noises. The results of this hypothesis are consistent with the research results of Lari Semnani (2018) and Norouz Abadi et al. (2015).

Regarding the fourth hypothesis, the coefficient of determination equal to 0.3154, that is, 31.54% of the changes in the dependent variable of behavioral noises can be explained by the variable of behavioral stability of investors, and the regression results (R) show that there is a positive correlation between investors' behavioral stability and their behavioral noises, respectively (0.286). Therefore, there is a significant relationship between the behavioral stability of investors and their behavioral noises. The results of this hypothesis are consistent with the research results of Lari Semnani (2018) and Norouz Abadi et al. (2015).

Regarding the ranking results, it can be stated that the first variable was the investors' personality characteristics with a value of (1), the second variable was the investors' emotions with a value of (0.840), the third variable was the investors' emotions (0.74), and the fourth variable was the investors' behavioral stability in the last rank with a value of (0.594) is placed.

There are investors who make instant decisions and do not try to show rational and appropriate behavior, and this behavior often originates from an optimistic view of the yield of a stock, and investors expect that a company's stock will grow according to the predictions made, but they do not pay much attention to the control variables or the market that may affect the current conditions in the future, and this will make them buy shares emotionally and intuitively. Most of the time, investors are not fully aware of the processes related to macro-level variables or dividends; But instead, they should make informed estimates of the market situation using available information. As more information becomes available, the investor's existing (prior) beliefs change to posterior beliefs (Saada M, Morrissey H, & Ball P. 2023). When investors gain knowledge in this way (that is, any new information over time changes their personal beliefs or uncertainties), a new source of variation over time in the investment opportunity set is created by changing return volatility.

Therefore, based on Simon's opinion, it can be concluded that people do not behave completely rationally in the capital market, and psychological factors and emotional states of investors affect their decisions and risk taking; Therefore, investors should understand this fact and try to use mechanisms to control their behavior and irrational decisions and take correct and appropriate decisions according to their mental states at the time of investment. Financial advisors can offer them a suitable portfolio considering the mood of each investor. Organizations and companies admitted to the Tehran Stock Exchange should also present a more suitable picture of their conditions to attract active investors in the stock exchange to achieve better achievements in the field of attracting stray capital in the stock exchange.

Also, by considering their weaknesses and following the principle of diversification, investors should form an optimal stock portfolio in terms of risk, and according to the analyzes presented in the stock market, while preventing possible damages from mass market behavior, recognize the profitable opportunities created due to the appearance of some investors, and use it in making appropriate decisions and try to reduce the cost of transactions and increase their returns by limiting the consequences of investing in inappropriate mental conditions, including anger or mental restlessness. Feelings of guilt and regret are one of the strongest psychological factors effective in human behavior, which overcome people's economic logic and influence their decisions; Hence, it is better for investors to understand this phenomenon, control its behavioral consequences, and by limiting its effects, consider daring to make decisions against the general flow of the market and follow their personal strategy. Given that the personality traits and mental states of people and of course, investors are not constant over time and at the same time they may show different behaviors, it is necessary for a correct understanding of how their mental states affect investment decisions. Many researches have been conducted in the field of investors' behavior and the factors that may influence their decision-making, and they have come to the conclusion that if traders could manage their portfolios well (that is, sell at a high price and buy at a low price) do), it can be claimed that they behave rationally (Masanson, 2018) the methodology of evidence economy seeks to understand human behavior and its nature; That is, how he behaves, not the way he should behave; And this category is somehow related to behavioral finance (Frank Forter, McGann and Elaine, 2018).

In general, an economic-rational person is a person who tries to achieve her own goals with the least cost. Later, other economists such as Thorstein Veblen and John Maynard Keynes criticized this model, considering the credibility it had among economists, that no human being can be fully aware of all events and determine his expected utility by always determining his expectations. It reached the maximum. In contrast, they assumed "bounded rationality"; That is, any attempt to understand how people make decisions depends on the organization of the information process and individual limitations (Frank Furter, McGann and Allen, 2017).

Financial literature has significant importance in the behavioral aspects of investors when making decisions. Along with other demographic factors (age, gender, personality type), it also has a significant effect on behavioral deviations (Farlin, 2018). One of the most famous models in the field of personality is the five-factor model. Many studies and research in recent years have confirmed the validity of the five-factor model and consider it the basis of the rest of the models (Nichelson, Swaney, Fenton, and Wilman, 2018) Philbeck, Hatfield, and Horvath (2018) in the studies they conducted with the Myers-Briggs model, determined that a piece of personality explains the behavior of investors. Cardoxi and Wang (2018) showed that people whose personality type is type A are more inclined to make risky investments; Because this type of personality type is more interested in high incomes compared to type B personality type.

The emotional decision of investors in the capital market causes the stock price to deviate from the real (fundamental) prices. When investors are optimistic, they may ignore negative information and overvalue the stock price under the influence of positive information. Conversely, when investors become pessimistic, they may ignore positive information and undervalue the stock price under the influence of negative information. When the stock price is overpriced, the cost of capital decreases. In this case, according to market timing theory, managers will issue new shares to obtain financing. After the managers obtain sufficient financial resources for investment, they may increase the company's investments. If managers increase company investments without careful evaluation, they may waste resources in projects with a negative net present value, which results in the phenomenon of overinvestment (Heidari, 2018). But if the company's stock price is lower than the actual price, the cost of capital will increase. In such cases, the managers will not issue new shares, and considering the company's investment reduction policy, they may abandon projects with a positive net present value, which will lead to the phenomenon of underinvestment. Therefore, the emotional decision of investors through the incorrect pricing of shares in the market and its consequences leads to the formation of the phenomenon of over-investment and under-investment (investment inefficiency).

In the end, for the future research of those interested in the field of investor behavior, the following practical and research proposals are presented.

Practical Suggestions:

1. It is suggested that investors should try to invest according to correct, scientific and logical information, because mass and intuitive investments are often without logic and are influenced by behavior and environment and may be high risk.
2. Investors and shareholders are suggested to get more familiar with the concept of profit per share prediction error and pay attention to it in making decisions. Because according to the results, companies that have a high

(positive/negative) profit forecast error will also have a high (positive/negative) abnormal return, and this is due to the increase or decrease in the demand for buying shares and consequently the increase or decrease in the price of shares.

3. It is also suggested that the shareholders and all the capital market activists pay attention to the market conditions along with other criteria in making rational decisions.

Research Suggestions:

1. Investigating stock market investors' reactions to news and events with emphasis on political, economic and corporate dimensions.
2. A review and comparison between the updated behaviors of investors over time and their personality traits.

Research Limitations:

1. Despite the existence of severe inflation in Iran's economy, the numbers and figures used in this research have not been adjusted based on the inflation index.
2. Limited access to information sources has caused the deletion of some observations due to the lack of necessary data. As a result, generalizing the results to companies outside the sample should be treated with caution.
3. The data under review is historical and its accuracy may be doubtful.

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