Investigating the Relationship Between Investors' Behavior and Managers' Expected Returns in the Tehran Stock Exchange

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ARTICLE INFO	ABSTRACT
	Behavioral finance is the investigation of distortions and irregularities in the behavior of investors. Herding behavior, as an instance of such distortions, is not limited to investors alone, as corporate managers also exhibit this type of turmoil. The collective behavior of investors and managers can create asset bubbles, causes market inefficiencies, and slows the incorporation of new information into stock prices. It also causes managers to focus on short-term results at the expense of long-term value creation. Understanding these consequences is crucial for investors to make more informed decisions. The present study, using the composite data model from 2021 to 2024, selects and studies a sample of 156 firms listed on the Tehran Stock Exchange by the systematic elimination method. The results of this study indicate that the investors' herding behavior affects the expected returns of shareholders; however, the effects of the herding behavior of managers are not statistically significant.

Introduction

As one of the key financial institutions in Iran, the Tehran Stock Exchange (TSE) plays an important role in financial companies and capital market development. The performance of this exchange is influenced by internal and external factors. Capital management in circulation and innovation is a key factor that affects the performance of companies. Research indicates that proper Capital management in circulation and attention to innovation challenges can help improve the financial performance of companies (Allameh et al., 2015).

However, the Tehran Stock Exchange also faces several challenges. Increasing competition, behavioral biases, information asymmetry, and diversification strategies are among the challenges that can negatively affect the performance and capital of companies. In general, the Tehran Stock Exchange is carefully managed to address these challenges to achieve optimal performance and sustainability (Enayat, 2001). The relationship between investors' behavior and managers' expected returns in the Tehran Stock Exchange (TSE) is a critical area of inquiry within financial markets. Behavioral finance, which integrates psychological factors into financial decision-making, has gained prominence in recent years. Investors' decisions to buy or sell stocks are influenced by a combination of internal and external psychological factors, including market sentiment, risk perception, and social influences (Nouri et al., 2017).

During the past few decades, some unusual phenomena and exceptions in the financial markets have caused many critics of financial theories. This reality has caused deep debates and a feeling of mistrust about the performance of financial theoriee, creating the background for the emergence of behavioral finance theory. The behavioral finance perspective states that some stock price changes have no fundamental reason, and behavioral factors play an important role in investors' decisions (Zhu & Niu, 2016). Behavioral finance leaves aside the basic assumptions of traditional financial theories, investigates the decision-making process of investors and their reaction to different conditions of financial markets, emphasizing more on personality, culture, and judgment of investors in investment decisions (Singh et al., 2023). One of the problems of financial markets is the reflection of herd behavior. Herd behavior is a term that describes how a group of investors, with no prior planning, can initiate irrational behaviors by imitating the judgment of others (Chen et al., 2013). The principle behind herd behavior is the fact that investors prefer to follow the judgment of others in their trading patterns instead of using their information sources. Such a behavior can potentially affect the efficiency of financial markets (Baillon, 2017).

The current research aims to explore the role of herd behavior in predicting returns in the Tehran Stock Exchange. To this end, the study examines the expected return, stock price, herd behavior of investors and managers, cash flows, company leverage, company size, and changes in the daily value of the company, as well as the interaction of these variables with each other. The study further examines whether the herd behavior, i.e. the herding of investors and managers, affects the expected return.

Once the investment is made, the expected return is the most important factor that should be considered. Therefore, any study in this domain is of special significance. It is worth mentioning that many research studies have been conducted in the field of behavioral finance in the Tehran Stock Exchange market, but none of them have addressed the effect of herd behavior on expected returns.

In case the behavior of investors and managers in the market is not rational, the market will face little certainty. Consequently, herd behavior of investors and managers can easily overshadow the market, which ultimately causes an intense wave of buying or selling in the market, leading to market inefficiency. Therefore, given the above, the results of this study can have practical significance and result in the efficiency of the capital market.

Theoretical Background of the Research

The capital market is a financial market in which long-term securities, such as stocks and bonds, are traded. It is also a market in which companies and governments can raise capital for their operations and projects through the sale of securities to investors (Han et al., 2018). The most important reason why people are encouraged to invest in the capital market is to gain returns and profit. The expected return is a term used in finance to describe the anticipated return of an investment based on the probability of different outcomes and the possible profit or loss associated with each outcome. Various methods have been established to estimate the expected return (Maji et al., 2021). The expected return on investment is an important factor to consider when making investment decisions because it helps investors evaluate the

risks and potential rewards of different investment options. However, it is important to note that expected returns are not guaranteed and may not reflect actual returns (Khoa & Huynh, 2021).

Among the factors influencing the expected return is the herd behavior of investors and managers. Behavioral finance is a behavioral science that combines psychology and finance to explain why people make irrational financial decisions (Frydman & Camerer, 2016). This shows that investors do not always act rationally. They can be influenced by emotions, biases, and other psychological factors when making investment decisions. The impact of behavioral finance on expected returns is complex and can vary depending on the specific factors involved (Zhang et al., 2022).

Some studies show that behavioral biases can lead to market inefficiencies and mispricing, the exploitation of which can create opportunities for investors to achieve higher returns (Mosenhauer et al., 2021). However, behavioral biases can also lead to suboptimal investment decisions, leading to lower expected returns. In general, investors should not only be aware of their biases and emotions when making investment decisions but also make rational and evidence-based decisions to maximize their expected returns (Weixiang et al., 2022). Herd behavior in investors, as a behavioral trend, refers to the tendency of investors to follow the actions of other investors in the market, which can lead to fluctuations, bubbles, and the bursting of those bubbles in the market (Nguyen et al. al., 2023). Factors that affect crowd behavior include market value and market efficiency. Understanding the causes and effects of herd behavior can help investors and policymakers make better decisions and promote market stability (Chen & Haga, 2021).

Previous Empirical Studies on the Relationship Between Herd Behavior and Returns

From the perspective of behavioral finance, investors and managers show herd behavior, which entails accepting significant risk without sufficient information, thereby increasing the trade-off between risk and return. The appearance of deviant behavior and investors' imitation of each other increases the investment risk in the market and ultimately leads to losses for the majority of investors. Therefore, this study aims to investigate the role of herding bias behavior in the Tehran Stock Exchange and examines the effects of herding bias among investors and managers on stock returns. In the following sections, the key investigations conducted in the field of herd behavior are reviewed.

Jahani et al. (2023) presented a model to explain the financial behavior of investors based on the perception of stock portfolio returns and psychological mechanisms in the Tehran Stock Exchange. The results of their research indicated that all behavioral biases have a direct and significant impact on the investors' decision-making. This, in turn, indicates that cognitive biases precede emotional biases, which, along with the influence of cultural factors, cause herd behaviors in the investors' decisions.

In their research, Rostami Jaz and Behrman (2023) examined the relationship between the investors' behavior and management's investment decisions, highlighting the role of tenure and management's financial literacy in this regard. By studying 130 companies admitted to the Tehran Stock Exchange during the period from 2010 to 2019, they identified a significant relationship between the investors' behavior and management's investment decisions. However, the management's tenure and financial literacy did not seem to influence the relationship between investors' behavior and management's investment decisions.

Mousavi Shiri et al. (2022) examined the herd behavior of investors in the stock exchange market. To this end, a sample of 116 companies admitted to the Tehran Stock Exchange from 2012 to 2018 was analyzed on a monthly basis. The results of the research showed that there was a significant positive relationship between the herd behavior of investors and the increase in interest rates. Such a relationship is also present in markets with a low market index, while it is not statistically significant in markets with a high market index. Moreover, the findings of the research indicated that there was a significant negative nexus between the herd behavior of investors and the decrease in the exchange rate in markets with a low market index. Nonetheless, this relationship was not confirmed in markets with a high market index.

Shiva (2022) investigated the role of herd behavior of investors in the Tehran stock market pricing, using Fama and French models. Studying 121 selected companies from 2013 to 2014, the study showed that herd behavior had significant positive effects on the value of stock size factor, stock value factor, and momentum factor of small companies in the Tehran stock market; however, herd behavior lacked any significant effect on the value of stock size factor, stock value factor and momentum factor of large companies in the Tehran stock market.

In another study, Timuri (202) investigated the effect of herd behavior on the decisions of real investors in the Tehran Stock Exchange. By studying a sample of 379 real investors active in the stock market, he identified a significant positive relationship between herd behavior and decision-making of real investors. In addition, it was found that the herd behavior variable was a suitable predictor for the decision-making of real investors, enjoying a higher beta coefficient.

Usriyono and Wahyudi (2023) examined the investment decisions and, in this regard, examined the role of financial literacy and behavior. By studying four types of overconfident behavior, herding behavior, anger-based behavior, and anxiety-based behavior on a sample of Indonesian investors, they showed that behaviors based on false confidence, anger, and anxiety significantly affected investment decisions; however, herding behavioral strain did not have a significant effect on financial decisions.

Vieito et al. (2024) investigated the financial behavior of Torshi in the integrated market of Latin America, including the stock market of Chile, Peru, Colombia, and Mexico, from 2002 to 2019. The results of their research confirmed the existence of herding in all normal situations as well as special conditions, such as bull and bear markets and conditions with low and high fluctuations. Additionally, the results of their research showed that the effects of ARCH and GARCH were statistically significant, indicating the effects of past information on stock returns and market fluctuations in subsequent periods, confirming the formation of a tendency for herding bias behavior among investors.

Liu et al. (2023) investigated herding behavior in the Chinese market by studying two groups of informed and uninformed shareholders. They found that these two groups showed different patterns of herding bias that affected the performance of the market, and these effects were significant in the period before the peak; however, they differed after the peak. It was also specifically found that informed shareholders showed less aggressive behavior than uninformed shareholders, but this gap decreased when the market fell and uncertainty increased. In addition, they found that in the period after the peak, informed and uninformed investors suffered from herding distortions concerning fundamental and non-fundamental factors, respectively.

In their research, Santi and Zwinkels (2023) studied the herding investment behavior of mutual funds and its consequences. They showed that the herding behaviors of the funds were significant and stable, and this tendency increased after periods of extreme market fluctuations. In addition, they found that herding skewed behavior was related to changes in the level of market dynamics and temporarily improved the performance of mutual funds but resulted in reduced fund flows.

Sharma (2024) conducted a research study entitled, "The Effect of Behavioral Bias on Investment Behavior in the Market," with the mediating role of brand trust in a period of three years (2021-2018) in all Indian states and union territories based on purposive sampling. The findings of this study suggested that behavioral biases played an effective role in influencing market investment behavior. However, when an investor trusts a brand, the influence of behavioral biases is reduced.

In his research, Tauseef (2023) investigated the herding behavior of investors for different calendar events and size-based stock portfolios in Pakistan. Taking into account the effects of the financial crisis caused by the coronavirus and the abnormal calendar news and events, he further showed that Torshi's behavior appeared in this era, and was evident among the larger and smaller stocks. Finally, he concluded that implementing internal trading laws and creating a transparent information environment could help reduce these effects and increase market efficiency.

In their research, Hassan et al. (2023) investigated herding volatility behavior in international stock markets. By studying the daily data of 33 countries, they evaluated the volatility behavior during the Eurozone crisis, the collapse of the Chinese market (2015-2016)), post-Brexit voting period, and the Coronavirus epidemic era. Their research showed that herding distortion behaviors caused by non-fundamental information was evident in negative market conditions in most countries. In addition, they found that behavioral bias caused by fundamental information was related to increased systemic risk. Furthermore, Granger causality tests as well as Johansen's vector error correction model provided strong empirical evidence of a strong interrelationship between herding behavior and systemic risk.

In their research, Hartanto and Mirz (2022) identified the factors affecting investment behavior on the stock market. By studying the behavior of individual investors in the markets of Sri Lanka, Nigeria, Vietnam, and Pakistan, they found that false self-confidence was the most important behavioral bias in financial markets. In addition, they deduced that unique regional attitudes, such as culture, were influential in the formation of behavioral biases such as truancy behavior.

Table 1. Previous Empirical Studies

Row	Researcher	Title	Findings
1	Ahn et al. (2024)	Business cycle and herding behavior in stock returns	This study explains the role of economic uncertainty as a bridge between business cycles and investors' herding behavior. Specifically, the growth rate of gross domestic product and the power law exponent are used as proxies for business cycles and herding behavior, respectively.
2	Costa (2024)	Herding states and stock market returns	The study investigates the impact of herd behavior states on stock market returns in the European region using a fixed effects model. Intense herding tends to occur during periods of lower returns and higher volatility compared to adverse herding, indicating that herding behavior significantly affects stock market performance, with intense herding leading to lower subsequent returns occurring in more volatile market conditions
3	Ah Mand et al. (2023)	Herding behavior and stock market conditions	Findings reveal the herding behavior of investors among Shariah-compliant stocks during up and down market conditions, with a non-linear relationship to the market return, while for conventional stocks, herding behavior does not exist with either linear or nonlinear relationships during the up and down market. Furthermore, for the whole market, herding behavior only exists during up markets with a nonlinear relationship to the market return. However, this relationship is not significant. Moreover, the results of this study are robust with respect to the effects of the Asian and global financial crises.
4	Vieito (2023)	Herding behavior in integrated financial markets: The case of MILA.	The authors found strong herding behavior under the general market conditions, and moderate and partial herding behavior under some specified market circumstances, such as bull and bear markets and high-low volatility states. Moreover, the pre-MILA period exhibits more herding behavior than the post-MILA period. The empirical results show that most of the ARCH and GARCH effects are statistically significant, implying that the past information of stock returns and market volatility significantly affect the volatility of following periods, which can also explain the formation of herding tendency among investors. Finally, the results of the robustness tests (Hwang & Salmon, 2004) confirm herding in all periods, except the full sample period for Mexico, and post-MILA period for Mexico and Colombia.
5	Hasan et al. (2023)	Herding behavior and systemic risk in global stock markets.	This paper provides new evidence of herding due to both non-fundamental and fundamental information in global equity markets. This article finds significant evidence of herding driven by non-fundamental information in the context of negative tail market conditions for most countries. This study also investigates the relationship between herding and systemic risk, suggesting that herding driven by fundamentals increases when systemic risk rises more significantly than when driven by non-fundamentals.
6	Gong et al. (2022)	Herding behavior in China's stock market under the background of implementation of the SHKSC policy.	The implementation of the Shanghai stock policy has not changed herd behavior. On the contrary, the herding effect has become more serious, and when the stock price falls, the herding effect of the Chinese stock market is also more obvious. It was also found that investors have no obvious investment preferences for the industry to which the stock belongs.
7	Rahayu (2021)	Herding behavior model in investment decision on emerging markets: In Indonesia.	The social impact of expert investors is greater than book value per share information on the herd behavior of investors in investment decisions. These findings state that investors should know their psychological factors and increase their control skills and capital analysis.
8	Hassan & jamil (2021)	Investigative study of investor's herding behavior during bullish and bearish market: A case of Pakistan stock exchange	The existence of herd behavior in the market is confirmed: (a) across different directions of positive and negative market returns, (b) when trading volume is high, (c) when the stock market is extremely volatile, and (d) during and after the financial crisis. Moreover, investors do not exhibit herding when the trading volume and volatility are low.
9	Sachdeva et al. (2021)	What make investors herd while investing in the Indian stock market?	Investor psychology, market information and stock characteristics are the top factors in herding behavior, while socio-economic factors appear as the least important factor driving herding behavior.
10	Naseem et al. (2021)	The investor psychology and stock market behavior during the initial era of COVID-19: A study of China, Japan, and the United States.	During the study period, findings revealed a concerning trend of negative investor psychology adversely affecting the selected stock markets. The pressures induced by the pandemic, coupled with investors' psychological resilience being challenged, fostered a climate rife with negative emotions and pervasive pessimism among market participants. This collective sentiment of pessimism is notably manifested in diminished financial commitments to the stock market, thereby contributing to a decline in stock market returns.
11	Qala Dera (2019)	Identifying factors influencing the formation of mass behavior of Tehran Stock Exchange investors.	Five factors are effective in the herding behavior of investors. The exchange rate, sanctions and brokers' opinions have the greatest impact on the behavior of the mass investors of the Tehran Stock Exchange.
12	Teh & De Bondt (1997)	Herding behavior and stock returns: An exploratory investigation.	Herding behavior in financial markets is a phenomenon where investors collectively follow the actions of others, often leading to significant market movements that can deviate from fundamental analyses. This behavior can manifest as simultaneous buying or selling of assets, driven by emotional responses rather than rational decision-making.

Research Methodology

Based on the theoretical foundations and the literature on the subject, this study analyzes the relationship between herding behavior and expected returns in the Tehran Stock Exchange. To this end, the effects of herding behavior of investors and managers on the company's expected returns are studied. Therefore, this research is considered a part of applied research regarding its purpose and a part of descriptive-correlational research regarding its method. Operationally, this study was conducted in 2022 and 2023, and to estimate the variables of the research, the time interval from 2014 to 2021 was covered. The scope of this research includes all companies listed on the Tehran Stock Exchange.

Rahavard Novin software was employed as an advanced tool for the precise extraction of financial data from companies' financial statements. This software is recognized as a reliable and comprehensive source that facilitates obtaining the necessary information for precise and efficient financial data analysis. After acquiring the required information, Excel was used to calculate the parameters. It is worth noting that the utilization of these two software applications was meant to enhance the performance and accuracy of data analysis, ensuring more precise reporting of results.

The reason for choosing companies listed on the Tehran Stock Exchange was the easy access to financial information, high reliability of that information, and the comparability of such data. A total of 156 companies were selected as the research sample. Various statistical tests, including the Limer and Hausman F-test, Breusch-Pagan test, and panel data test, were used for statistical analysis. The results have been estimated in the form of a panel data regression model. The restricted F-test compares the residual sum of squares between the pooled model and the fixed effects model, allowing for the identification of the most suitable approach for the data structure.

The Hausman test was utilized to ascertain whether the effects were fixed or random. This test evaluates the null hypothesis that the random effects model is appropriate against the alternative fixed effects model. The Breusch-Pagan test, on the other hand, was employed to investigate heterogeneity of variance. This test examines the null hypothesis of homoscedasticity (constant variance) in the residuals, with the alternative hypothesis being the presence of heteroscedasticity. The results of these tests guided the selection of the most appropriate model for the analysis, ensuring the validity and reliability of the findings.

This study sought to analyze the relationship between herding behavior and expected returns in the Tehran Stock Exchange, and in this regard, it studied the effects of the herding behavior of investors and managers on the company's expected returns. Therefore, the expected return of the company was regarded as the dependent variable, while the trend of herding behavior at the two levels of investors and managers was regarded as the independent variables. Additionally, to better examine the relationship between herding behavior and efficiency, the role of factors such as size, leverage, cash flows, and relative value of the company was considered as control variables. Based on this, research models can be designated as follows:

$$ER_{it} = \beta_0 + \beta_1 IHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it} + \varepsilon_{it} \tag{1}$$

$$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it} + \varepsilon_{it} \tag{2}$$

$$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 MHR_{it} + \beta_3 CF_{it} + \beta_4 FL_{it} + \beta_5 FS_{it} + \beta_6 FG_{it} + \varepsilon_{it} \tag{3}$$

ER   Expected return = excess investment return (stock return is subtracted from the risk-free return)
IHR   Herding behavior of investors = Based on the following model
MHR Manager's herding behavior = Based on the following model
CF   Cash flows = the ratio of cash flows to total assets
FL   Company leverage = the ratio of total liabilities to total assets
FS   Firm size = logarithm of firm's total assets
FG   Relative value of the company = the ratio of the value at the end of the period to the book value

The herding model developed by Kohan et al. (2020) is used to measure the variable of herding investor behavior:

$$IHR = \alpha_0 + \gamma_1 |R| + \gamma_2 R^2 + \varepsilon \tag{*1}$$

Whereby IHR is the herding behavior of the investor at the market level. If the coefficient γ-2 is negative and significant, it indicates the presence of lumped torsion and takes the value of 1; otherwise, it will be zero. Additionally, there is a herding behavior of the manager when there is an absolute standard deviation from the ratio of investment to capital. In this case, the value will be one, otherwise it will be zero. Given the above, the relationship proposed by Alabas (2019) is used to calculate the herding behavior of the manager:

$$MHR = \left\| \left| \frac{I}{K_{i,t}} \right| - \overline{\left| \frac{I}{K_{-i,t-1}} \right|} \right\|$$ (*2)

in which I is the net investment and, K_(i,t) is the capital stock at the beginning of the period, and K_(-i,t-1) is the capital stock of other companies except company i in year t-1.

Data Analysis and Findings

Descriptive and inferential statistical methods were used to analyze the collected data. Necessary pre-tests were also conducted. After confirming the results of the pre-tests, the research hypotheses were tested, and the results were estimated in the form of regression models. Considering that the data of this research was in the form of a panel, the researcher employed the restricted F test to determine the estimation method for each of the research models, choosing between the panel and combined data methods. The Hausman test was used to determine whether the effects were fixed or random, and the Brush-Pagan test was further used to investigate variance heterogeneity. It should be mentioned that Stata software was used to test the hypotheses in this study. Descriptive statistics of the variables are presented in Table 2.

Table 2. Descriptive Statistics of the Main Research Variables

Research variables	symbol	average	middle	s.d	min	max
Expected return	ER	89/327	16/854	228/567	-81/920	2409/758
Investors herding	IHR	0/276	-0/020	1/236	-1/308	14/344
Manager herding	MHR	0/661	0/181	2/565	-0/003	70/363
Cash flow	CF	0/125	0/106	0/150	-0/385	2/415
Corporate leverage	FL	0/563	0/559	0/200	0/037	1/363
Size of the company	FS	6/447	6/349	0/658	4/828	9/020
Relative value of the company	FG	0/001	0/000	0/002	-0/008	0/040

The present study examined the relationship between the herding behavior and the expected return in the Tehran Stock Exchange. The effects of the herding behavior of investors and managers on the company's expected return were scrutinized along with the controlling role of flow factors. It took into account cash flows, company leverage, company size, and relative value of the company. The descriptive statistics of the research sample indicated that the average expected return of the studied companies was 89%, and their standard deviation was equal to 228, indicating the extreme fluctuations of the stock market during the studied period. The average behavior of investors and managers was equal to 0.276 and 0.661, respectively, and their standard deviation reached 1.236 and 2.565, respectively.

Testing Research Hypotheses

This study used the composite data model to analyze the model. Before estimating the regression model, it is necessary to check the significance of each variable. For this purpose, Levin-Lin Chu's test was used. The results of this test are presented in Table 3. The results showed that all research variables were statistically significant.

Table 3. Summary of the Results of Levin-Lin Chu's Test to Examine the Significance of the Variables

Variable	Test statistics	$p-value$
ER	−3/856	0/0001
IHR	−8/636	0/000
MHR	−2/395	0/0083
CF	−3/666	0/001
FL	−1/654	0/046
FS	−2/063	0/019
FG	−11/823	0/000

To determine the estimation methods of each of the research models, the restricted F test was used to choose between the panel data and pooled data methods, and the Hausman test was utilized to determine whether the effects were fixed or random. Additionally, the Breush-Pagan test was used to examine the heterogeneity of variance. The regression results obtained using t- and F- statistics in the ordinary least squares method and z- and χ^2 statistics in the least squares method were generalized, and their probability was analyzed. In the following, the test results of each research hypothesis are explained separately.

First Hypothesis (H1)

The first hypothesis of the current research is:

"There is a significant relationship between the herd behavior of investors and the expected return."

$$ER_{it} = \beta_0 + \beta_1 IHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it} \tag{1}$$

ER   Expected return = excess investment return (stock return is subtracted from the risk-free return)
IHR   Herd behavior of investors = based on the following model
CF   Cash flows = the ratio of cash flows to total assets
FL   Company leverage = ratio of total liabilities to total assets
FS   Firm size = logarithm of firm's total assets
FG   Relative value of the company = the ratio of the value at the end of the period to the book value

The statistical statement of the above assumption is as follows:

$$\begin{cases} H_0 : \beta_1 = 0 \\ H_1 : \beta_1 \neq 0 \end{cases}$$

If the coefficient of investors' herd behavior (β_1) is significant in the regression model, it indicates the effect of this factor on the expected return on the Tehran Stock Exchange. Due to the use of composite data, to test the desired hypothesis, the restricted F test must be performed to choose between panel and composite data methods. Based on the results of this test, if the probability of F statistic is more than 0.05, the combined data method should be used; otherwise, the panel data method should be employed. The results of the bound F test for this regression model indicate that the probability value of the F statistic is 1.000 and since this value is greater than 0.05, the hypothesis H_0 based on the use of the combined data method is not rejected. Therefore, the consolidated data method was used to estimate the model. The summary of the results of the bound F test for the model is represented in Table 4.

Table 4. Summary of the Results of F Test for Evaluating Regression Model Estimation Method (1)

Test	Test statistics	$p-value$	result
F	0/40	1/000	Consolidated data method

After choosing the estimation method, the hypothesis of variance heterogeneity is examined. In order to investigate the heterogeneity of variance, the Breush-Pagan test was used. The summary of its results is presented in Table 5.

Table 5. Summary of Breush-Pagan Test Results to Check Homogeneity of Variance of the Regression Model (1)

Test	Test statistics	$p - value$	result
Breush - Pagan	16/13	0/0001	Variance heterogeneity

The results of the Breush-Pagan test show that the obtained probability value is equal to 0.00. Hence, the hypothesis H_0based on the homogeneity of variance is rejected. Due to the heterogeneity of variance, the generalized least squares method was used to estimate the model. The summary of the final estimation results of the model (2) using the consolidated data method and the GLS estimator is presented in Table 6.

Table 6. Summary of Regression Model Estimation Results

$$ER_{it} = \beta_0 + \beta_1 IHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it}$$

Varribale	Estimated coefficient	z statistic	$p - value$
c	20/0281	0/93	0/350
IHR	185/9064	78/76	0/000
CF	-3/1054	-0/23	0/817
FL	-22/1209	-2/21	0/027
FS	5/9317	1/89	0/059
FG	-6123/94	-6/22	0/000
χ^2 statistic	6422/84		
The significance of the χ^2 statistic	0/000		
coefficient of determination (r^2)	0/8596		
Dorbin-Watson (D-W) statistic	1/78		

In order to investigate the relationship between the herd behavior of investors and stock returns, the z-statistic and its probability value was used. According to the results of Table 6, the value of the obtained coefficient for the herd behavior of investors is equal to 185/906, which is significant at the 95% confidence level, indicating the significant effect of the herd behavior of investors. It is based on the expected return of shares in the Tehran Stock Exchange. Therefore, hypothesis H_0 is rejected and the first hypothesis of the research based on the significant relationship between the herd behavior of investors and the expected return is accepted at the confidence level of 95%. Additionally, the studies indicate that the leverage and value of the company significantly affected the expected return, but the effects of cash flows and company size were not statistically significant at the 99% confidence level.

To examine the whole model, the χ^2 statistic was further used. According to the probability obtained for the χ^2 statistic, which is equal to 0.000, it can be concluded that the fitted regression model is significant. The coefficient of determination in the relevant model is equal to 0.8596, which shows that 85.96% of stock return fluctuations in the Tehran Stock Exchange are explained by the herd behavior of investors. Additionally, the value of Dorbin-Watson statistic is equal to 1.78, which is within the allowed range and indicates the absence of autocorrelation. In sum, the test of the first research hypothesis shows that at the 95% confidence level, the factor of herd investor behavior significantly affects stock returns, and therefore, the first research hypothesis is based on the significance of the herd behavior relationship. It is confirmed by the investor and the return on shares is at the confidence level of 95%.

Second Hypothesis Test (H2):
The second hypothesis of the current research is:
"There is a significant relationship between the herd behavior of managers and the expected return."
To test the above hypothesis, the following regression model was used:

$$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it} \tag{2}$$

ER   Expected return = excess investment return (stock return is subtracted from the risk-free return)
IHR   Manager's herd behavior = based on the following model
CF   Cash flows = the ratio of cash flows to total assets
FL   Company leverage = the ratio of total liabilities to total assets

FS Firm size = logarithm of firm's total assets

FG Relative value of the company = the ratio of the value at the end of the period to the book value

The statistical statement of the above assumption is as follows:

$$\begin{cases} H_0 : \beta_1 = 0 \\ H_1 : \beta_1 \neq 0 \end{cases}$$

If the coefficient of herd behavior (β_1) in the above regression model is significant, it indicates the effect of this factor on the expected return in Tehran Stock Exchange and confirms the second hypothesis of the research. In order to test the second research hypothesis, the restricted F test is first used to choose between panel data and combined data. The results of F test are presented in Table 7. The results of the restricted F test for this regression model show that the probability value of the restricted F statistic is greater than 0.05, and the hypothesis H_0 based on the use of the combined data method is not rejected. Therefore, the consolidated data method is used to estimate the model (2).

Table 7. Summary of the Results of Limer's F Test for Evaluating Regression Model Estimation Method (2)

Test	Test statistics	$p - value$	result
F	0/38	1/000	Consolidated data method

After choosing the estimation method, the Breush-Pagan test was used to investigate the heterogeneity of variance, and the summary of its results is presented in Table 8. This test shows that the obtained probability value is equal to 0.000. Hence, the hypothesis H_0 based on the homogeneity of variance is rejected.

Table 8. Summary of Breush-Pagan Test Results to Check Homogeneity of Variance of the Regression Model (2)

Test	Test statistics	$p - value$	result
Brush - Pagan	35/16	0/0001	Variance heterogeneity

Due to the heterogeneity of variance, the generalized least squares method was used to estimate the model. The summary of the final estimation results of the model (3) using the consolidated data method and the GLS estimator is presented in Table 9.

Table 9. Summary of Regression Model Estimation Results (2)

$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 CF_{it} + \beta_3 FL_{it} + \beta_4 FS_{it} + \beta_5 FG_{it}$			
varribale	Estimated coefficient	z statistic	$p - value$
c	190/848	3/39	0/001
MHR	-1/5485	-0/71	0/475
CF	67/7272	1/92	0/055
FL	35/7812	1/36	0/175
FS	-20/3011	-2/46	0/014
FG	-13364/37	-5/04	0/000
χ^2 statistic	32/39		
The significance of the χ^2 statistic	0/000		
coefficient of determination (r^2)	0/0300		
Dorbin-Watson (D-W) statistic	1/73		

In order to investigate the role of herd behavior of managers in the pricing of capital assets in the Tehran Stock Exchange, the z-statistic and its probability value were used. According to the results presented in Table 8, the value of the obtained coefficient for the distortion of the manager's herd behavior is equal to -1.5485, and its probability value is equal to 0.47, which indicates the absence of significant effects of the herd behavior of managers on efficiency of expected shares in the Tehran Stock Exchange. Based on this, the hypothesis H_0 is not rejected and the second research hypothesis based on the significant relationship between the herd behavior of the manager and the expected return is not confirmed. In addition, the results show that the size and relative value factors of the company negatively and significantly affected the stock returns; nonetheless, the effects of the cash flow and leverage factors were not statistically significant at the 95% confidence level. Based on this, it can be

concluded that in the Tehran Stock Exchange, stock returns are not affected by the skewed behavior of managers, and small stocks with a lower book value to market value ratio enjoy higher returns.

In order to examine the whole model, the χ^2 statistic was further used. According to the probability obtained for the χ^2 statistic, which is equal to 0.000, it can be concluded that the fitted regression model is significant. The coefficient of determination of the relevant model is equal to 0.0300, which shows that only 3% of the changes in the excess returns of the companies listed on the Tehran Stock Exchange are explained by the size and value of the company. Additionally, the value of Dorbin-Watson statistic is equal to 1.73, which is within the allowed range and indicates the absence of autocorrelation. In sum, the test of the second research hypothesis indicates that at the 95% confidence level, there is no significant relationship between the herd behavior of the manager and stock returns in the stock exchange. Therefore, the second research hypothesis is not confirmed at the 95% confidence level.

Test of the Third Hypothesis(H3):

The third hypothesis of the current research is:

"There is a significant relationship between the herd behavior of investors and managers, and the expected return."

To test the above hypothesis, the following regression model was used:

$$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 MHR_{it} + \beta_3 CF_{it} + \beta_4 FL_{it} + \beta_5 FS_{it} + \beta_6 FG_{it} \tag{3}$$

ER   Expected return = excess investment return (stock return is subtracted from the risk-free return)
IHR   Herd behavior of investors = based on the following model
MHR Manager's herd behavior = based on the following model
CF   Cash flows = the ratio of cash flows to total assets
FL   Company leverage = the ratio of total liabilities to total assets
FS   Firm size = logarithm of firm's total assets
FG   Relative value of the company = the ratio of the value at the end of the period to the book value

The statistical statement of the above assumption is as follows:

$$\begin{cases} H_0 : \beta_1, \beta_2 = 0 \\ H_1 : \beta_1, \beta_2 \neq 0 \end{cases}$$

If the coefficients of investor's herd behavior (β_1) and manager's herd behavior (β_2) in the above regression model are significant, it indicates the role of herd behavior in predicting stock returns in the Tehran Stock Exchange. To test this hypothesis, the F test and Hausman's test were used to choose between panel and combined data methods. The results of the restricted F test for this regression model indicate that the probability value of the restricted F statistic is 1.00. Hence, the hypothesis H_0 based on the use of the combined data method was not rejected. Therefore, the consolidated data method was used to estimate the model (3).

Table 10. Summary of the Results of Limer's F Test for Evaluating Regression Model Estimation Method (3)

Test	Test statistics	$p - value$	result
F	0/40	1/000	Consolidated data method

After choosing the estimation method, Breush-Pagan test was used to check the heterogeneity of variance. The summary of its results is presented in Table 11. This test suggests that the probability value of the test statistic is equal to 0.000. Therefore, the hypothesis H_0, based on the homogeneity of variance, is rejected.

Table 11. Summary of Breush-Pagan Test Results to Check Homogeneity of Variance of the Regression Model (3)

Test	Test statistics	$p - value$	result
Brush - Pagan	16/26	0/0001	Variance heterogeneity

Due to the existence of variance heterogeneity, the generalized least squares method was used instead of ordinary least squares to estimate the model. The summary of the final estimation results of model (3) using GLS estimator is presented in Table 12.

Table 12. Summary of Regression Model Estimation Results 3

$$ER_{it} = \beta_0 + \beta_1 MHR_{it} + \beta_2 MHR_{it} + \beta_3 CF_{it} + \beta_4 FL_{it} + \beta_5 FS_{it} + \beta_6 FG_{it}$$

varribale	Estimated coefficient	z statistic	$p-value$
c	19/9034	0/93	0/354
IHR	185/8637	78/78	0/000
MHR	-0/8661	-1/05	0/294
CF	-2/0268	-0/15	0/880
FL	-22/7339	-2/26	0/024
FS	6/0961	1/93	0/053
FG	-6379/08	-6/31	0/000
χ^2 statistic		6431/04	
The significance of the χ^2 statistic		0/0000	
coefficient of determination (r^2)		0/8599	
Dorbin-Watson (D-W) statistic		1/74	

In order to investigate the effect of the herding bias of investors and managers on stock returns, the z-statistic and its probability value were employed. As depicted in Table 12, the value of the obtained coefficient for the herding investor behavior factor is 185.86, which is significant at the 95% confidence level, revealing the role of herding investor behavior in Stock price fluctuations in the Tehran Stock Exchange. However, the effects of the managers' herding behavior were not statistically significant at the 95% confidence level. Therefore, considering the significance of the factor of herding investor behavior, hypothesis H_0 is rejected and the third hypothesis of the research based on the relationship between herd behavior and return is confirmed. In addition, the results suggested that the factors of leverage and growth of the company significantly affected stock returns at the 95% confidence level; on the other hand, the effects of size and cash flow were not statistically significant. Given the above, it can be concluded that the herd behavior of investors, along with the company's leverage and growth opportunities, are the most important factors in predicting stock returns in Tehran Stock Exchange.

In order to examine the whole model, the χ^2 statistic was further utilized. According to the probability obtained for the χ^2 statistic which is equal to 0.000, it can be concluded that the fitted regression model is significant. Hence, the obtained coefficients can be cited for each of the research variables. In total, the test of the third research sub-hypothesis indicated that, at the confidence level of 95%, the herd behavior of investors significantly affected the stock returns in the Tehran Stock Exchange, while the effects of the herd behavior of managers was not statistically significant on the return. Accordingly, the third research hypothesis, based on the relationship between herding volatility and the expected return of shares in Tehran Stock Exchange, is confirmed.

Discussion

The study investigates the relationship between investors' behavior and managers' expected returns in the Tehran Stock Exchange (TSE), focusing on herd behavior and its impact on market efficiency and asset pricing. The findings indicate that while investors' herd behavior significantly affects expected returns, managers' herd behavior does not exhibit a statistically significant impact. This distinction highlights the different roles and influences that investors and managers have on market dynamics.

Herd behavior among investors can lead to asset bubbles and market inefficiencies since collective actions driven by emotions such as fear and greed cause asset prices to deviate from their fundamental values (Nouri, 2017). This behavior results in delayed incorporation of new information into stock prices, as seen in the slow pricing of environmental and social factors (Tarighi et al., 2023). The study results align with previous research indicating that psychological factors significantly influence perceived risk and returns, affecting investment decisions (Nguyen et al., 2022). Understanding these dynamics is crucial for investors aiming to navigate and potentially exploit market inefficiencies.

Contrary to investors, the herd behavior of managers did not show a significant impact on expected returns. This finding suggests that while managers may exhibit herd behavior, it does not translate into measurable effects on stock returns. This could be due to the different motivations and constraints faced by managers compared to individual investors. Managers' focus on short-term results, and cognitive biases might not significantly alter market prices in the same way as collective investor

behavior (Yi at el., 2019). This distinction is important for understanding the different factors that drive market behavior and pricing.

The study highlights the importance of understanding behavioral biases in financial markets. Investors can potentially profit from market inefficiencies caused by herd behavior by making more informed decisions. Additionally, the findings suggest that regulatory measures aimed at reducing irrational exuberance and promoting transparency could enhance market efficiency (Zhou et al., 2023). By addressing these behavioral biases, regulators and market participants can work towards a more stable and efficient market environment.

In conclusion, the research underscores the significant role of investors' herd behavior in influencing expected returns in the TSE, while managers' herd behavior appears to have a negligible effect. These insights contribute to the broader understanding of behavioral finance and its implications for market dynamics and investment strategies. Future research could further explore the specific psychological factors influencing investor behavior and the potential regulatory measures to mitigate the adverse effects of herding in financial markets.

Concerning the comparison of the results obtained with those of other studies conducted in this field, it should be mentioned that Liu et al. (2023), and Hassan et al. (2021) showed that this behavior affects the performance of investors by examining the herd behavior. From this point of view, the results of the present study confirm the findings of these studies. Nasiri et al. (2021) investigated 141 companies in a study entitled, "Asset Pricing Modeling Using Behavioral Variables." The results showed that using the Fama Macbeth approach, accounting information risk, investors' trading behavior, and investors' sentiments had a direct and significant effect on the companies' stock returns.

On the other hand, examining behavioral factors affecting investment decisions, Usriyono and Wahyudi (2023) argued that herding behavioral bias does not have a significant effect on financial decisions. This is in contradiction with the results of the current research.

In the studies carried out at a national level, Taghipour (2023), and Jahani et al. (2023) stated that herd behavior has a significant effect on the decisions and performance of investors, which is consistent with the findings of the present study; On the other hand, Pakdelan et al. (2019) investigated the behavior bias of managers and investors from the viewpoint of herding ification at the company and industry levels. They provided evidence of the existence of herding ification behavior bias of managers and investors and its effects on the value of the company. Salim (2019) also investigated the herding behavior bias and showed that the behavioral bias of investors and managers has a significant effect on the value of the company. In the present study, no evidence was found for the existence of a significant relationship between the herding behavior of efficient managers and changes in the value of the company, which is not consistent with the findings of Salim (2019) and Pakdelan et al. (2019).

Conclusion

To achieve the goals of the research, three hypotheses were formulated followed by a regression model designed to test each of the hypotheses. The results of the first research hypothesis on investigating the relationship between investor herd behavior and expected return showed that the herd behavior trend significantly affects the expected return of shares in the Tehran Stock Exchange. The first research hypothesis, based on the significant relationship between the herd behavior of investors and the expected return, was confirmed. In justifying the obtained results, it is concluded that stock returns in the Tehran Stock Exchange during the research period were more influenced by the public invitation to the stock exchange and the resulting excitement. The influx of small investors to the stock market, who generally lacked sufficient knowledge in the field of investment and the risks associated with it, resulted in a herding influx causing a stunning jump in stock prices during the year 2018. At the beginning of 2019, prices fell sharply in the second half of 2019 and 2014. This, in turn, confirms the significant relationship between the herd behavior of investors on expected returns and investment decisions.

The inferential statistic for the second research hypothesis indicated that, by controlling the factors of cash flows, size, leverage, and relative value of the company, the herd behavior of the managers did not have a significant effect on the stock returns. Accordingly, the second research hypothesis based on the significant relationship between the herd behavior of the manager and the expected return is not

confirmed. Additionally, the results indicated that the factors of size and relative value negatively and significantly affected the stock returns.

Given the above, it can be concluded that in the Tehran Stock Exchange, stock returns are not affected by the skewed behavior of managers, and small stocks with a lower book value to market value ratio have higher returns. In justifying the effects of the size factor, it can be stated that investors in the Tehran Stock Exchange, consciously or unconsciously, have different expectations from their performance. This is due to the differences between large and small companies, which is rooted in the number of shares and diversity of shareholders, market share, economies of scale, profit management facilities, etc. Such an expectation can also be observed in the performance of growth companies compared to value companies. According to the results of the previous hypothesis regarding the herd behavior of investors and its effects on the company's stock returns, it seems that this trend is more inclined to trade in small-cap and growth stocks, which is attributed to the shallowness of the Tehran Stock Exchange. This trend is also consistent with the nature of herd behavior in our market, and as a result, small stocks with a lower book value to market value ratio generate higher returns. Moreover, although the behavior of managers does not influence expected returns on the Tehran Stock Exchange, it can enhance their decision-making. By examining and collecting data on herd behaviors and their historical trends, managers can improve their ability to anticipate market fluctuations and create effective marketing strategies that align with group tendencies. Additionally, it is important for them to prioritize risk management, as herd behavior can contribute to market volatility. Providing education to employees about the consequences of herd behavior and fostering a culture of logical analysis can help mitigate any negative impacts. Ultimately, utilizing insights from herd behavior can improve market forecasting and investment strategies.

Finally, the third research hypothesis, on the relationship between the herd behavior of investors and managers, and the expected return, suggests that the herd behavior of investors affects the stock returns of companies listed on the Tehran Stock Exchange. However, the effects of herd behavior of managers were not statistically significant. In addition, it was found that the factors of leverage and growth of the company significantly affected stock returns. Accordingly, it can be concluded that the herd behavior of investors along with the company's leverage and growth prospects are considered the most important factors in predicting stock returns in the Tehran Stock Exchange.

In justifying the results obtained in this research, it can be mentioned that due to the trust in the slogan and media tactics suggesting that the stock exchange was a safe place for investment, many individuals decided to obtain a stock exchange code and enter the capital market. Based on the statistics of the Central Securities Depository Company and settlement of funds, nearly 9 million stock exchange codes were obtained only in the first half of 2019. Additionally, the number of stock exchange codes in the capital market doubled in this short period. A flood of people with no financial education and knowledge entered the stock market and bought and sold shares, as a gamble, by following others. They, somehow, created a severe turbid behavior that caused severe fluctuations in the market. The mushroom growth of official and informal basket-making activities also fueled this herding behavior. Providing information on the positive outlook of the companies by analysts and market participants resulted in the strong desire of the investors towards the shares of these companies. Eventually, the market collapse and the fading analysis on the growth of such companies caused more sales pressure and, finally, more severe fluctuations in this category of stocks. The significance of the inverse effects of the ratio of book value to market value as a measure of the company's relative growth index in all research models is regarded as evidence for such a trend. On the other hand, it seems that the instant decisions made by the stock exchange organization during this period, such as the changes in the range of fluctuations, the requirement for market management without the required infrastructure, the issuance of subordinated securities, the imposition of its costs on publishers, specification of instances of manipulation and seduction in transactions and the creation of tension in the market, led to the intensification of this herd behavior of investors, which requires more in-depth studies and research to explore its effects.

Research for the Future and Research Limitations

Some lines of inquiry can be suggested for future research. The effects of the herd behavior of investors and managers on the return of each industry is a topic worth exploring. It is also suggested

that the effects of other variables at the company level as well as at the macro level, such as economic growth and inflation, along with the factors studied in this research should be investigated on the yield of securities.

Taking steps to reach a goal is usually accompanied by limitations; therefore, the limitations of the present research can be mentioned as follows: First, the statistical population is limited, and access to information about companies listed on the stock exchange is restricted. Additionally, investment companies were excluded from the statistical population due to the unique nature of their activities. Consequently, extrapolating the results of this research to other companies should be approached with caution. Second, considering the specific time frame of the present study, the results lack the necessary certainty for all periods, and their generalization to other periods requires careful consideration. Finally, various indicators can affect the results of the current research and pose challenges to the generalizability of the findings.

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