The Impact of Information on the Behavior of Stock Traders (AHP Approach)

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ABSTRACT

The effectiveness of the stock market agents with complete information and incomplete information on market trends, prices and demand for stocks and the effect of employees' behavior on the lack of information on employees with complete information (mass behavior survey) have been investigated in this research. For this purpose, by providing a researcher made questionnaire in relation to the stock exchange, using the statistical inference, the analysis of the results of the research has been done and the validity of the presented relationships has been investigated using analytical hieratical approach (AHP). Because in this article, the impact of information on traders' behavior. The 30 of traders have been selected as a sampling sample for Iran Koodro's and Pars Petro-chemical shares in the period of 2022. According to the current questionnaire and its results and practical observations, it can be concluded that transactions with sufficient information on prices are more effective than transactions with full information. Consequently, companies with incomplete information are more successful in the short run.

1. Introduction

$\mathcal{B}$ehavioral economics and financial behavior is a discipline that uses the scientific method in the context of cognitive psychology to incorporate emotional and social factors into the analysis and understanding of markets and economic factors. Since the unit of analysis in these two sciences is the person and his behavior, the interaction between economics and psychology can be used for economic theorizing used by economists. When the US financial crisis hit its peak in 2008 and the government shut down, there was a debate over why, given the calculations, graphs and forecasts of economists, the economic situation has reached such a critical level? (Stratimirović et al, 2018). During the past several years, finance scholars and researchers have conducted several studies for establishing different theories to explain the financial markets environment considering investors as rational. One of this hypothesis is the efficient market hypothesis (EMH), which says that capital markets are informationally efficient and that investors may make the best investment decisions assuming information symmetry. By examining a number of share prices in the market, Fama (1991) discovered that the market is efficient when all of the necessary information is held by market participants for investment decision-making. However, Raiffa and Raiffa (1968), Kahneman and Tversky (1979) observed that an individual investor's behavior, in theory, diverges from that in practice. They found that traditional financial models are unable to clarify and predict all financial decisions and fail to explain some phenomena that affect an investor's stock-picking choice (Tanzina and Pallabi 2022). Some emotional issues move investors in making investment decisions which is the evidence of irrational market behavior or inefficient markets. Here, the importance of behavioral finance is clear. Individuals may not always be pertinent, according to behavioral finance; instead, they are human beings who discover the irrationality of investors in general, leading them to make irrational investing decisions.

In this research, a hypothesis is considered to examine the success of the groups of agents with complete information and incomplete information, which has been investigated for Iran Koodro's and Pars Petro-chemical shares in the period of 2022. In fact, it is specifically examined which of these two groups have had more success in their trading activities. The effect of massive behavior on these individuals over a month has also been studied. Therefore, it is generally examined whether further information can be a guarantor of the success of individuals. And whether massive behavior exists according to the amount of information obtained for individuals.

In second section, the theoretical framework and empirical studies have been reviewed and in third section, the research methodology has been explained. The fourth section consist of empirical findings and finally in fifth section, the conclusion and policy recommendation of paper has been reported.

2. Theoretical Framework and Empirical Research

In this section, firstly, the importance and value of information and the severity of the reactions of individuals to it, as well as in the form of empirical studies, the most important studies on the factors affecting the selection of stocks are examined. The traditional finance theory assumes that investors always make rational decisions based on perfect information, but behavioral finance argues that investors are influenced by their emotions, biases, and cognitive constraints. The debate between modern finance theory and behavioral finance theory on the influence of non-financial factors on stock prices is ongoing. Modern finance theory posits that the stock market is efficient and that stock prices reflect all available information, while behavioral finance theory asserts that psychological and emotional factors can impact stock prices. The impact of behavioral finance factors on investment decisions has been extensively studied in the scientific community. Researchers have identified a wide range of behavioral finance factors that can influence investment decisions, including biases, emotional biases, social influences, perception of risk, and personality traits. Numerous

studies have examined the impact of these factors on investment decisions and have found that they can lead to suboptimal decision making. Investors show a risk-averse attitude when it comes to investing, preferring a smoother and more stable level of risk tendency risk perception, and risk propensity (Vlahovic et al, 2021). While an investor's risk attitude tends to remain stable, their risk perception is dynamic and can change in different situations. Increased risk perception leads to higher transaction frequency and reduced investment in the stock market. Due to a low-risk perception, market participants tend to engage in herding behavior, which adversely affects their investment decisions. Herding behavior has a significant impact on the decision-making processes of investors (Madaan and Singh, 2019). On the other hand, the effect of behavioral aspects on stock investment decision-making can be linked with the cognitive dissonance theory which states that the reactions of humans shoot from the view of themselves as "smart, nice people" and people tend to ignore or reject the information that conflicts with this smartness. The conceptual framework for our analysis can be based on cognitive dissonance as labeled by psychologists rather than rational behavior under Bayesian decision theory (Almansour et al., 2023).

Recently, financial decisions play a decisive role in the development of society at a macro and micro level. With the increasing spread of the Internet and other information tools, the context for the rapid transfer of information and awareness to the majority of people in the community has emerged. This tool can also help in knowing the behavior of other people active in financial markets. On the other hand, accuracy, time of promotion, learning and development, and the attractiveness of information can make a significant contribution to the acceptance of it by community members and influence their decision making. Also, ignorance of the incompleteness of information can be commonplace among many stock market participants and it causes people to decide, despite their lack of knowledge, and because of the abundance of their decisions, the entire stock market is affected by the results of their decisions.

In the fundamental analysis, certain criteria are considered. These criteria are the information that an agent needs in a stock exchange for a stock transaction. An inclusive point based on experience is that many agents focus on a single set of criteria at the time of decision-making, and practically no attempt is made to obtain information from other criteria. Because they believe that all the criteria do not affect their profits.

In the meantime, the question that arises is how much information will help to expand financial markets and wise decisions? In other words, how much will people make decisions based on accurate information and using accurate reasoning? Are decisions based on factors other than reasoning capable of affecting the overall stock market? If the answer is yes, how much does this impact?. In this research, we are trying to investigate, having a thorough knowledge of the fundamental analysis criteria, how much the agent is likely to have in predicting the correct prices. Also, how much predicted by agents with complete information and incomplete information can affect the overall market and other decisions of agents (review of mass behavior). The hierarchical analysis process is one of the most comprehensive systems designed for decision making with multiple criteria has been showed by Ghodsypour (2006), since this technique provides the possibility of formulating the problem in a hierarchical manner, as well as the possibility of considering different quantitative and qualitative criteria. This process involves various choices in decision making and the ability to analyze sensitivities to criteria and sub-criteria. In addition, based on a paired comparison that facilitates judgment and computation, the degree of compatibility and incompatibility of the decision has been shown and is one of the advantages of this technique in multi-criteria decision making.

In a study by Bondt and Thaler (1985) it has been shown that research in empirical psychology suggests that, in breach of Boice's law, most people tend to "overreact" to unexpected news incidents. This study examines the market efficiency of whether these behaviors affect stock prices. In research held by Yue et al. (2000), a mathematical model is proposed to examine the

behavior of stock brokers based on their knowledge of available information. In this model, agents are divided into two categories with complete knowledge and incomplete knowledge, and their prediction has been examined and it is argued that unethical agents will have a huge impact on the market process due to their plurality of their decisions. Nikomaram et al. (2008) in a research entitled Measuring Responsibility of Agents in the Stock Market, suggested that changing the feelings and behavior of agents should be an appropriate and robust explanatory factor for explaining the short-term movements in stock returns alongside Other fundamental analysis factors should be considered. In this paper, an indicator is presented based on available data to measure the behavioral behavior of agents in dealing with risk, which can be used to explain pricing movements in the stock market. The well-designed index well in the market conditions of Iran shows the overall market situation in terms of agents' feelings. It is also used as a factor explaining the overall rate of return, and the statistical test has also confirmed such an assumption. In research held by Yeh et al. (2011), the effect of excessive trust on the market has been examined and it is argued that the lack of knowledge of the agent and how much reliance they will have on their incomplete information will affect the overall market and prices. Massive behavior or similar behavior behaviors, as one of the behavioral fears among agents, is shown in Saeidi et al. (2011). In this research, the existence of massive behavior among agents in Tehran Stock Exchange has been investigated and tested. The masses have been construed as adhering to one of the indicators, such as market returns or the returns of a particular industry, and agents are considering buying and selling stocks regardless of their risk and returns. This study uses the mass market beta as a criterion for mass recognition using market index. The researchers used the moving window with a 24-month window (proposed by Huang and Salmon in 2006) to calculate the massive beta. In this study, the lumber mass values for each of the months of the years 2002-2007 were calculated and evaluated. According to the obtained results, significant masses were

observed during the research period. Then, in order to measure the behavior of the variability of mass, variance and accumulation of its long-term behavior, along with the specific variables of the stock market and inflation as a specific macroeconomic variable, was investigated. The results of the EG-ADF co-integration test showed that the variables with convergent mass differentiation criteria are.

Arabamzarizdi et al. (2013) using the information of stock exchanges in Tehran Stock Exchange and applying the models of split-split based on the stock returns of the companies and the beta-based model in the space-state structure, experimentally test the phenomenon of collective behavior. The survey period is from the beginning of 2005 to the end of 2005 using weekly observations of the returns and volume of transactions, which totaled 24442 views. It has been shown that agents often do not have the autonomy of making investment decisions and prefer to follow the decisions of others to adopt an independent approach, which means confirmation of the collective behavior phenomenon in Tehran Stock Exchange. Seyfallahi et al. (2015) have shown that financial illiteracy of participants in all markets, especially financial markets, violates the first condition of a free market according to its theoretical definition (equal access to information) and can affect the performance of those markets; Therefore, one of the main issues in the performance of financial markets is the issue of financial literacy of current or potential contributors. Policy makers who, based on market economy theories, are trying to develop financial markets, should be aware that the minimum level of financial literacy required for financial market participants should be so that the goals to be achieved can be met, as well as the level of financial literacy of contributors in time periods Different, should be properly evaluated. Baradaran Hassanzadeh et al. (2015) in an article entitled "Factors Affecting the Selection of Shares in Tehran Stock Exchange Based on Hierarchical Analyzes" stated that one of the issues of agents in stock exchanges such as Tehran Stock Exchange is the choice of the correct criteria for comparing stock types. The results of this study show that among

the 25 variables affecting stock selection, according to the factor analysis technique, finally 8 variables are considered as effective variables on stock selection in Tehran Stock Exchange companies and the effective variables on Selection of stocks in order of priority or ranking including the average dividend, dividend, dividend yield, dividend per share, earnings per share, net profit to sales ratio, operating profit to sales ratio, return on equity and rate of return Assets. Karimkhani and Islami (2015) have tried to expand the country's scientific literature to study the factors influencing the behavior of the agents of the component and thus provide an approach to clarify their decision making in Tehran Stock Exchange. After a deep and comprehensive study of scientific literature, the initial conceptual framework was placed on the Delphi methodology by the experts. After the Delphi Phase III, theoretical saturation of the consensus and convergence of responses led to the finalization of the research framework. Schnellenbach (2015) defines and analyzes the field of behavioral political economy, and distinguishes between weak and strong versions. Also, the use of behavioral economics has been shown in political economy, and the development of this new field has been traced from its historical origins to today. In a research implemented by Stratimirović (2018), it attempts to reduce the time series of the stock market indices. To analyze the data, wavelet transform analysis and the average displacement method have been used. Communities have been found in cyclic behavior in the data set. Also, local decomposition behavior has been used to rank basic economic markets. Ebrahimnejad et al. (2020) have studied the intraday patterns of trading volume, size, return, and volatility using the Tehran Stock Exchange (TSE) high frequency data from 2008 to 2015. The main findings of their research showed that trading value and volume follow a J-Shaped pattern, whereas absolute return exhibit an L-Shaped behavior. These findings are consistent with the existing studies which document an increase in trading value and volume as well as absolute return. Ramshini et al. (2021) have investigated the effects of information asymmetry and illiquidity related to cluster trading on market efficiency and

examine the mediating roles of these two variables in the relationship between noise trading and market efficiency during the 2014 -2020. The results indicated that significant inverse effects of information asymmetry and illiquidity related to cluster trading and market return. However, the effect of illiquidity related to cluster trading on market return was stronger than that of information asymmetry. Tanzina and Pallabi (2022) have explored the influence of behavioral aspects on stock investment decision-making in Bangladeshi individual investors during 281 respondents of the Dhaka Stock Exchange. The result shows that risk aversion and risk perception are the two most influential emotional dimensions that impact investors' decisions. The findings are consistent with the other researchers and highlight the fact that investors hardly act according to the norms recommended in the financial theories. Yaser Almansour et al. (2023) examined the effect of behavioral finance factors on investment decisions in the Saudi equity markets through the mediating variable of risk perception. An online questionnaire was distributed to 150 individual investors, out of which 134 were returned and ready for analysis. The data is analyzed using structural equation modeling (SEM). The empirical results showed that herding, disposition effect, and blue chip bias have a significant positive impact on risk perception. Overconfidence has a significant positive effect only on investment decision making, but not on risk perception. Risk perception is found to be significantly positively related to investment decision making. All four behavioral finance factors have a significant positive indirect effect on investment decision making through risk perception. Khezri et al. (2023) have analyzed the behavioral sample of traders in capital market of Iran in 2022 by applying snow-ball sampling method. The results of the research show that the most important causal conditions that cause traders to recognize their behavior are, respectively, risk effect (prospect theory), levels of financial behavior, efficient market hypothesis, over/under-reaction phenomenon, over/under confidence phenomenon, Arbitrage phenomenon, news phenomenon, bias phenomenon,

positive thinking phenomenon, patience phenomenon, mass (herd) behavior phenomenon, overtrading phenomenon, excitement phenomenon, trading volume, lack of information, behavioral biases, cognitive biases, stock market index, trading strategy.

The major contribution of this article is to investigate the impact of information on the trader's behavior and gent's decisions, and also at the same time, it is determined how the decisions of each agent will change the behavior of other agents.

In this study, an analytical hierarchical process (AHP) has been used to classify the type of agents into groups with perfect information and imperfect information. The hierarchical analysis method makes it possible to make effective decisions on complex issues by simplifying and accelerating the natural decision making process of AHP. Basically, it is a way of analyzing the complex situation to its combined parts and selecting these parts or variables based on hierarchical order.

3. Model

Documentary and library so that we will analyze the results of the research by providing a researcher made questionnaire in conjunction with the stock exchange and using inferential statistics. The agents involved in the stock exchange and those who are independently exchanging shares. Includes knowledgeable people about news and information and people with less awareness in the stock market.

The target population of the study is agents and real agents active in the stock market that invest a significant amount of their capital in the stock market. The choice of the real people has been done in consultation with the professors and experts in this field, which is why we can examine the individual behaviors of these individuals and examine how their behavior and choices will influence the price trend. To analyze the data from the questionnaire, a hierarchical analysis process will be used which is a suitable method for analyzing behavioral economics. Analysis of this information

will be done using the Excel software. The purpose of this essay is to examine the effect of information on the behavior of agents in the stock market and the results of their transactions. Based on the assumptions made, the decisions of the agents affect the stock price. In fact, the assumption is that having information is not a guarantor of obtaining a better result in transactions. The initial assumption is that two groups of agents include agents with complete information and agents with inaccurate information on the stock market. Agents have incomplete information of those individuals who decide on the basis of technical analysis and market analysis, news, the examination of the need for commodity markets and monetary markets, the prediction of future events, etc., and conduct their transactions. Conversely, agents with complete information include those who, in addition to the above, make use of fundamental analysis in their reviews and decisions, and examine the parameters of this analysis method, including their decision-making principles. Because to carry out this analysis, it needs to have financial information and statistics about the supplier, usually these dealers have more detailed information than the first category.This model includes two sections: agents and markets

3.1. System design
In terms of system logic, it can be divided into four parts. These include expectations, market equilibrium, agent assessment and market value assessment. The market equilibrium section uses the Grossman competitive stock market model to create a market equilibrium price.   By default, people in this context have rationality and make their decisions in such a way as to make the most possible profit or to bear the least possible losses. But at the same time they will come up with different solutions that they consider to be the best possible solution.

3.2. Expectancy Relationship

The agents receive personal information from the market and their price expectations are made up. The actual stock value is determined by the following equation:

$$p(t + 1) = \alpha_1(t) + \alpha_2(t) + \varepsilon(t) + p(t) \tag{1}$$

α_1 and α_2 and $\mathcal{E}$ are obtained by normal distribution. Informed agents, based on α_1 and α_2, which is randomly generated based on the information received in each period, and $\mathcal{E}$ is the noise, decides. But an uninformed agent only does this based on α_1. Each of these random variables indicates the choice of one of the methods of market analysis. Analysis methods are divided into two main categories. Market and technical analysis techniques that are based only on news and market trends and trends, and fundamental analysis methods that require more knowledge of the stock market, and users of this method naturally need more information than agents with inadequate information. Agents with inadequate information use only market and technical analysis methods, and therefore only α_1 will be modeled in their prediction model. Agents with complete information, in addition to market analysis and technical analysis, also use the fundamental analysis method and therefore, in addition to α_1, α_2, they will be modeled in their prediction function. The expected prices of the informed and uninformed agent are as follows:

$$\tilde{p}_i(t) = \alpha_{1i}(t) + \alpha_{2i}(t) + \varepsilon_i(t) + p_i(t - 1) \tag{2}$$

$$\tilde{p}_j(t) = \alpha_{1j}(t) + \varepsilon_j(t) + p_j(t - 1) \tag{3}$$

3.3. Market Balance

In the following, the market equilibrium price is determined. It is assumed that each agent has the utility function with the absolute risk aversion coefficient as follows:

$$U_i(W_i) = -e^{-a_i w_{ij}} \qquad a_i > \cdot \tag{4}$$

Each agent has a fixed cash value of c (t) and stock q (t) in the initial period. The initial budget equation can be written as follows:

$$W_i(t_0) = c_i(t_0) + p(t_0)q_i(t) \tag{5}$$

Expected budget in the future can be shown by Equation 6:

$$\widetilde{W}_i(t) = (1 + r)c_i(t_0) + \tilde{p}(t)q_i(t) \tag{6}$$

An agent's wealth includes risk-free assets (cash) and risky assets (stocks). The cash asset has a fixed rate of return (r) and a risk-averse rate of return on the real price. By putting Equation 5 in Equation 6, we obtain Equation 7:

$$\widetilde{W}_i(t) = (1 + r)W_i(t_0) + [\tilde{p}_i(t) - (1 + r)p(t_0)]q_i(t) \tag{7}$$

To maximize the utility function, Equation 4 can be represented by Equation 8:

$$Max\, E\big[U_i\big(\widetilde{W}_i\big)\big] = Max\left[a\left(E\big(\widetilde{W}_i\big) - \frac{a}{2}var\big(\widetilde{W}_i\big)\right)\right] \tag{8}$$

From equation 7 we can obtain equation 9 and equation 10:

$$E(\widetilde{W}_i) = E\big((1 + r)W(t_0) + \big[\tilde{p}_i(t) - (1 + r)p\left(t.\right)\big]q_i(t)\big) \tag{9}$$

$$Var(\widetilde{W}_i(t)) + [q_i(t)]^2 Var(\tilde{p}_i(t)) \tag{10}$$

By subtracting equations 9 and 10 from 8, the following results are obtained:

$$max_q\{a[\,E((1 + r)\,W_i(t_0) + (\tilde{p}_i(t) - (1 + r)p(t_0))q_i(t))] -$$
$$\frac{a}{2}[q_i(t)]^2 Var(\tilde{p}_i(t))\} \tag{11}$$

Equation 11 yields equation 12:

$$[\tilde{p}_i(t) - (1 + r)p(t_0)] - a[q_i(t)]Var(\tilde{p}_i(t)) \tag{12}$$

Personal demand is stated as follows:

$$[q_i(t)] = \frac{[(\tilde{p}_i(t) - (1+r)p(t_0)]}{aVar(\tilde{p}_i(t))} \tag{13}$$

The liquidity demand function is defined by Equation 14:

$$c_i(t) = W_i(t) - \tilde{p}_i(t) = \frac{[(\tilde{p}_i(t) - (1+r)p(t_0)]}{aVar(\tilde{p}_i(t))} \tag{14}$$

Consider the value of X as the stock value constant, m the number of agents and n, and the number of unknowing agents, the market price is defined by Equation 15:

$$P_{market} = \frac{\sum_{i=1}^{m+n}(W_i(t) - c_i(t))}{X} \tag{15}$$

Using the market price, the actual real demand price is expressed in Equation 16:

$$q_i(t) = \frac{W_i(t) - c_i(t)}{P_{market}} \tag{16}$$

At the end of the period, while all the officers are informed of the stock price, the personal wealth function is expressed as the following equation:

$$W_i(t + 1) = [p(t) - p_{market}]q_i(t) + (1 + r)c_i(t) \tag{17}$$

3.4. Agent Assessment

In this section, we set the status of the agents. The personal wealth of each agent is assessed after the actual wealth is determined. The agent is deemed to be bankrupt with negative profit and removed from the market. In future experiments, agent's beliefs, learning, strategy effectiveness, etc. will be evaluated and updated.

3.5. Market Valuation

This section states that the market value remains constant. The profit or loss of the stock market value is determined by Equation 18.

$$S(t) = \sum_{i=1}^{m+n} c_i(t) + [p(t) - p_{market}]\sum_{i=1}^{m+n} q_i(t) \tag{18}$$

If S (t)> 0, there will be a tax on the total amount applied to all agents. If S (t) <0, the new agents will be added to the economy and the type of strategy (informal, uninformed, logical or irrational) will be the same with the most successful agent.

3.6. Questionnaire Design

To investigate the mathematical relationship, the following parameters have been used:

- Initial stock price
- Stock price forecast by the agent
- Initial stock numbers
- Complete knowledge or incomplete knowledge of the agent

For this purpose, a questionnaire is prepared which receives the first three parameters directly from the respondent. In the case of the third parameter, a paired comparison with three questions is proposed, in which the respondent is asked to measure the importance of the three methods of the following market analysis in pairwise and compare:

- Market analysis (based on news and trends analysis)
- Technical analysis
- Fundamental analysis

An agent who has prioritized market analysis and technical analysis to the fundamental analysis, is an uninformed agent. Otherwise, it is informed agent on the category. Based on the data obtained and calculated, we can conclude that which group of agents in the stock market is more successful and also have more impact on the stock market.

4. Empirical Findings

In the questions section of the questionnaire, the ratio of incompatibility of responses to the questionnaire was examined, and there was an incompatibility questionnaire in the responses. The inconsistency rate in the Expert Choice software is calculated for each individual's responses individually. The criterion provided by Saati and Harker is that if the IIR ratio calculated in the software is smaller than or equal to 0.1, there is no inconsistency in the answers of the respondent. The results of this section are presented in the table below.

Table 1. AHP result for each agent and Identifing the type of agent

Agents No	Fundamental analysis	Technical analysis	Market analysis	IIR	Agents Category
1	0.818	0.091	0.091	0.00	Completely informed
2	0.603	0.315	0.082	0.00	Completely informed
3	0.759	0.130	0.111	0.02	Completely informed
4	0.751	0.162	0.087	0.00	Completely informed
5	0.764	0.121	0.115	0.00	Completely informed
6	0.758	0.151	0.091	0.03	Completely informed
7	0.750	0.171	0.078	0.09	Completely informed
8	0.077	0.806	0.117	0.07	Incompletely Informed
9	0.073	0.761	0.166	0.70	Incompletely Informed
10	0.096	0.760	0.144	0.08	Incompletely Informed
11	0.081	0.784	0.135	0.03	Incompletely Informed
12	0.117	0.200	0.683	0.02	Incompletely Informed
13	0.066	0.785	0.149	0.08	Incompletely Informed
14	0.072	0.114	0.814	0.05	Incompletely Informed
15	0.097	0.094	0.809	0.00	Incompletely Informed
16	0.072	0.814	0.114	0.05	Incompletely Informed
17	0.082	0.368	0.550	0.00	Incompletely Informed
18	0.062	0.285	0.653	0.07	Incompletely Informed
19	0.082	0.550	0.368	0.08	Incompletely Informed
20	0.127	0.687	0.185	0.09	Incompletely Informed
21	0.113	0.709	0.179	0.05	Incompletely Informed
22	0.102	0.726	0.172	0.03	Incompletely Informed
23	0.094	0.740	0.167	0.01	Incompletely Informed
24	0.087	0.751	0.162	0.01	Incompletely Informed
25	0.082	0.761	0.158	0.00	Incompletely Informed
26	0.109	0.729	0.163	0.80	Incompletely Informed
27	0.096	0.760	0.144	0.08	Incompletely Informed
28	0.121	0.764	0.115	0.00	Incompletely Informed
29	0.111	0.778	0.111	0.00	Incompletely Informed
30	0.103	0.789	0.108	0.00	Incompletely Informed
31	0.096	0.799	0.105	0.01	Incompletely Informed
32	0.097	0.671	0.233	0.09	Incompletely Informed
33	0.101	0.633	0.266	0.05	Incompletely Informed

Agents No	Fundamental analysis	Technical analysis	Market analysis	IIR	Agents Category
34	0.105	0.577	0.318	0.01	Incompletely Informed
35	0.109	0.476	0.415	0.02	Incompletely Informed
36	0.130	0.435	0.435	0.00	Incompletely Informed
37	0.147	0.447	0.406	0.01	Incompletely Informed
38	0.143	0.545	0.312	0.02	Incompletely Informed
39	0.137	0.600	0.262	0.06	Incompletely Informed
40	0.162	0.455	0.384	0.03	Incompletely Informed
41	0.156	0.551	0.293	0.00	Incompletely Informed
42	0.144	0.642	0.215	0.07	Incompletely Informed
43	0.149	0.605	0.245	0.03	Incompletely Informed
44	0.174	0.460	0.365	0.05	Incompletely Informed
45	0.167	0.556	0.278	0.00	Incompletely Informed
46	0.159	0.608	0.232	0.02	Incompletely Informed
47	0.153	0.644	0.203	0.05	Incompletely Informed
48	0.148	0.670	0.182	0.08	Incompletely Informed
49	0.185	0.465	0.350	0.07	Incompletely Informed
50	0.176	0.558	0.265	0.00	Incompletely Informed
51	0.168	0.610	0.221	0.01	Incompletely Informed
52	0.162	0.645	0.193	0.03	Incompletely Informed
53	0.156	0.671	0.173	0.06	Incompletely Informed
54	0.151	0.691	0.158	0.09	Incompletely Informed
55	0.195	0.468	0.337	0.09	Incompletely Informed
56	0.185	0.560	0.255	0.01	Incompletely Informed
57	0.176	0.612	0.212	0.00	Incompletely Informed
58	0.169	0.646	0.185	0.02	Incompletely Informed
59	0.163	0.671	0.166	0.04	Incompletely Informed
60	0.158	0.691	0.151	0.06	Incompletely Informed
61	0.154	0.707	0.139	0.09	Incompletely Informed
62	0.204	0.470	0.326	0.12	Incompletely Informed
63	0.193	0.562	0.245	0.02	Incompletely Informed
64	0.184	0.612	0.204	0.00	Incompletely Informed
65	0.176	0.646	0.178	0.01	Incompletely Informed
66	0.170	0.671	0.159	0.03	Incompletely Informed
67	0.164	0.691	0.145	0.05	Incompletely Informed

Agents No	Fundamental analysis	Technical analysis	Market analysis	IIR	Agents Category
68	0.160	0.706	0.134	0.07	Incompletely Informed
69	0.123	0.388	0.489	0.05	Incompletely Informed
70	0.147	0.406	0.447	0.01	Incompletely Informed
71	0.146	0.505	0.350	0.09	Incompletely Informed
72	0.167	0.417	0.417	0.00	Incompletely Informed
73	0.163	0.513	0.323	0.05	Incompletely Informed
74	0.183	0.424	0.393	0.00	Incompletely Informed
75	0.177	0.519	0.304	0.02	Incompletely Informed
76	0.171	0.573	0.256	0.07	Incompletely Informed
77	0.196	0.429	0.375	0.02	Incompletely Informed
78	0.190	0.523	0.288	0.01	Incompletely Informed
79	0.183	0.576	0.242	0.05	Incompletely Informed
80	0.176	0.612	0.212	0.09	Incompletely Informed
81	0.209	0.433	0.359	0.03	Incompletely Informed
82	0.201	0.525	0.274	0.00	Incompletely Informed
83	0.193	0.577	0.230	0.03	Incompletely Informed
84	0.186	0.612	0.202	0.07	Incompletely Informed
85	0.219	0.435	0.345	0.05	Incompletely Informed
86	0.211	0.526	0.263	0.00	Incompletely Informed
87	0.202	0.578	0.220	0.02	Incompletely Informed
88	0.194	0.613	0.193	0.05	Incompletely Informed
89	0.188	0.639	0.173	0.08	Incompletely Informed
90	0.229	0.437	0.334	0.06	Incompletely Informed
91	0.219	0.527	0.253	0.00	Incompletely Informed
92	0.210	0.578	0.212	0.01	Incompletely Informed
93	0.202	0.612	0.185	0.03	Incompletely Informed
94	0.196	0.638	0.166	0.06	Incompletely Informed
95	0.190	0.658	0.152	0.09	Incompletely Informed
96	0.135	0.367	0.498	0.08	Incompletely Informed
97	0.215	0.404	0.381	0.00	Incompletely Informed
98	0.209	0.496	0.294	0.03	Incompletely Informed
99	0.202	0.549	0.248	0.08	Incompletely Informed
100	0.216	0.586	0.199	0.08	Incompletely Informed

In Table 2, the stock price predicted by the agents for the shares of Iran Khodro Company, which uses equation (3.1) (to calculate the predicted price by each agent) and the final price of the market using Equation 15 (to calculate the final price of the market) On October 24, 2022.

The average difference between the prices predicted by agents at the real market price is one of the criteria by which we can measure the success rate of individuals in the stock market. Accordingly, the average price difference for agents with complete information and dealers with incomplete information is set to -59.285 and 3.838, respectively. It is clear that the predicted price difference for the agents has less than the incomplete information of the agents with complete information.

Table 2. Results from Equations for Iran Khodro Stock on October 24

Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type		Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type
1	2,495	2,693	-198	Completely informed		51	2,586	2,693	-107	Incompletely Informed
2	2,357	2,693	-336	Completely informed		52	2,600	2,693	-93	Incompletely Informed
3	2,891	2,693	198	Completely informed		53	2,560	2,693	-133	Incompletely Informed
4	2,788	2,693	95	Completely informed		54	2,490	2,693	-203	Incompletely Informed
5	2,558	2,693	-135	Completely informed		55	2,511	2,693	-182	Incompletely Informed
6	2,787	2,693	94	Completely informed		56	2,528	2,693	-165	Incompletely Informed
7	2,560	2,693	-133	Completely informed		57	2,592	2,693	-101	Incompletely Informed
8	2,634	2,693	-59	Incompletely Informed		58	2,964	2,693	271	Incompletely Informed

Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type		Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type
9	2,573	2,693	-120	Incompletely Informed		59	2,501	2,693	-192	Incompletely Informed
10	2,557	2,693	-136	Incompletely Informed		60	2,737	2,693	44	Incompletely Informed
11	2,977	2,693	284	Incompletely Informed		61	2,701	2,693	8	Incompletely Informed
12	2,897	2,693	204	Incompletely Informed		62	2,883	2,693	190	Incompletely Informed
13	2,516	2,693	-177	Incompletely Informed		63	2,653	2,693	-40	Incompletely Informed
14	2,912	2,693	219	Incompletely Informed		64	2,811	2,693	118	Incompletely Informed
15	2,816	2,693	123	Incompletely Informed		65	2,762	2,693	69	Incompletely Informed
16	2,887	2,693	194	Incompletely Informed		66	2,699	2,693	6	Incompletely Informed
17	2,655	2,693	-38	Incompletely Informed		67	2,926	2,693	233	Incompletely Informed
18	2,812	2,693	119	Incompletely Informed		68	2,522	2,693	-171	Incompletely Informed
19	2,988	2,693	295	Incompletely Informed		69	2,486	2,693	-207	Incompletely Informed
20	2,559	2,693	-134	Incompletely Informed		70	2,783	2,693	90	Incompletely Informed
21	2,833	2,693	140	Incompletely Informed		71	2,948	2,693	255	Incompletely Informed
22	2,556	2,693	-137	Incompletely Informed		72	2,726	2,693	33	Incompletely Informed
23	2,491	2,693	-202	Incompletely Informed		73	2,679	2,693	-14	Incompletely Informed
24	2,486	2,693	-207	Incompletely Informed		74	2,933	2,693	240	Incompletely Informed

Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type		Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type
25	2,969	2,693	276	Incompletely Informed		75	2,705	2,693	12	Incompletely Informed
26	2,755	2,693	62	Incompletely Informed		76	2,727	2,693	34	Incompletely Informed
27	2,468	2,693	-225	Incompletely Informed		77	2,665	2,693	-28	Incompletely Informed
28	2,746	2,693	53	Incompletely Informed		78	2,795	2,693	102	Incompletely Informed
29	2,500	2,693	-193	Incompletely Informed		79	2,813	2,693	120	Incompletely Informed
30	2,480	2,693	-213	Incompletely Informed		80	2,612	2,693	-81	Incompletely Informed
31	2,709	2,693	16	Incompletely Informed		81	2,599	2,693	-94	Incompletely Informed
32	2,696	2,693	3	Incompletely Informed		82	2,844	2,693	151	Incompletely Informed
33	2,611	2,693	-82	Incompletely Informed		83	2,474	2,693	-219	Incompletely Informed
34	2,532	2,693	-161	Incompletely Informed		84	2,986	2,693	293	Incompletely Informed
35	2,473	2,693	-220	Incompletely Informed		85	2,574	2,693	-119	Incompletely Informed
36	2,991	2,693	298	Incompletely Informed		86	2,507	2,693	-186	Incompletely Informed
37	2,574	2,693	-119	Incompletely Informed		87	2,708	2,693	15	Incompletely Informed
38	2,614	2,693	-79	Incompletely Informed		88	2,506	2,693	-187	Incompletely Informed
39	2,884	2,693	191	Incompletely Informed		89	2,868	2,693	175	Incompletely Informed
40	2,668	2,693	-25	Incompletely Informed		90	2,491	2,693	-202	Incompletely Informed

Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type		Agents No	The price predicted by the agent	Market Price	The difference between the market price and the price predicted by the agents	Agents Type
41	2,558	2,693	-135	Incompletely Informed		91	2,799	2,693	106	Incompletely Informed
42	2,538	2,693	-155	Incompletely Informed		92	2,815	2,693	122	Incompletely Informed
43	2,465	2,693	-228	Incompletely Informed		93	2,824	2,693	131	Incompletely Informed
44	2,746	2,693	53	Incompletely Informed		94	2,618	2,693	-75	Incompletely Informed
45	2,770	2,693	77	Incompletely Informed		95	2,992	2,693	299	Incompletely Informed
46	2,545	2,693	-148	Incompletely Informed		96	2,524	2,693	-169	Incompletely Informed
47	2,884	2,693	191	Incompletely Informed		97	2,481	2,693	-212	Incompletely Informed
48	2,991	2,693	298	Incompletely Informed		98	2,651	2,693	-42	Incompletely Informed
49	2,843	2,693	150	Incompletely Informed		99	2,892	2,693	199	Incompletely Informed
50	2,951	2,693	258	Incompletely Informed		100	2,645	2,693	-48	Incompletely Informed

Source: Research Results and Results from MATLAB Software.

For statistical analysis of this issue, a single-sample t test was used. Thus, the average price predicted by the two groups of agents is checked at the market price in a single-sample t-test.

By examining the value of t Stat, it is found that the absolute value of the test statistic is greater than the t Critical two-tail, and the null hypothesis that there is no significant difference is rejected. So the forecasted average price values for agents with full information have a significant difference with the market price.

Table 3. Results of the two-sample t-test for Iranian auto stock on October 24

(Completely informed)

t-Test: Paired Two Sample for Means		
	Variable 1	*Variable 2*
Mean	2634	2833.645399
Variance	0	10355.54623
Observations	7	7
Pearson Correlation	#DIV/0!	
Hypothesized Mean Difference	0	
Df	6	
t Stat	-5.190650884	
P(T<=t) one-tail	0.001016597	
t Critical one-tail	1.943180281	
P(T<=t) two-tail	0.002033193	
t Critical two-tail	2.446911851	

Source: Excel software

Table 4. Results of the two-sample t-test for Iranian auto stock on October 24

(Incompletely informed),

t-Test: Paired Two Sample for Means		
	Variable 1	Variable 2
Mean	2634	2651.678
Variance	0	16350.19
Observations	93	93
Pearson Correlation	#DIV/0!	
Hypothesized Mean Difference	0	
df	92	
t Stat	-1.33327	
P(T<=t) one-tail	0.092867	
t Critical one-tail	1.661585	
P(T<=t) two-tail	0.185734	
t Critical two-tail	1.986086	

Source: Excel software

By examining the t stat value, it is found that the absolute value of the test statistic is smaller than the t Critical two-tail, and the null hypothesis that there is no significant difference is not rejected. So the forecasted average price values for agents with incomplete information have no significant difference with the market price.

The results of the mathematical model for Iran Khodro stocks by repeated 10 equation1 and equation 15-3 for Iran Khodro stocks are shown in the following table.

Table 5. Mathematical Model Results with 5 Repeats for Equation 1 and 3 for Iran Khodro Stocks

Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type
1	9	Completely informed		26	6	Incompletely Informed		51	8	Incompletely Informed		76	6	Incompletely Informed
2	5	Completely informed		27	5	Incompletely Informed		52	1	Incompletely Informed		77	6	Incompletely Informed
3	6	Completely informed		28	4	Incompletely Informed		53	7	Incompletely Informed		78	5	Incompletely Informed
4	4	Completely informed		29	1	Incompletely Informed		54	5	Incompletely Informed		79	6	Incompletely Informed
5	9	Completely informed		30	9	Incompletely Informed		55	9	Incompletely Informed		80	2	Incompletely Informed
6	3	Completely informed		31	4	Incompletely Informed		56	1	Incompletely Informed		81	4	Incompletely Informed
7	1	Completely informed		32	8	Incompletely Informed		57	6	Incompletely Informed		82	7	Incompletely Informed
8	4	Incompletely Informed		33	5	Incompletely Informed		58	5	Incompletely Informed		83	5	Incompletely Informed
9	4	Incompletely Informed		34	3	Incompletely Informed		59	2	Incompletely Informed		84	9	Incompletely Informed
10	5	Incompletely Informed		35	3	Incompletely Informed		60	9	Incompletely Informed		85	5	Incompletely Informed
11	5	Incompletely Informed		36	1	Incompletely Informed		61	3	Incompletely Informed		86	7	Incompletely Informed
12	9	Incompletely Informed		37	9	Incompletely Informed		62	2	Incompletely Informed		87	2	Incompletely Informed
13	9	Incompletely Informed		38	4	Incompletely Informed		63	4	Incompletely Informed		88	2	Incompletely Informed
14	6	Incompletely Informed		39	6	Incompletely Informed		64	1	Incompletely Informed		89	9	Incompletely Informed
15	7	Incompletely Informed		40	2	Incompletely Informed		65	4	Incompletely Informed		90	7	Incompletely Informed
16	1	Incompletely Informed		41	2	Incompletely Informed		66	5	Incompletely Informed		91	4	Incompletely Informed
17	4	Incompletely Informed		42	6	Incompletely Informed		67	5	Incompletely Informed		92	7	Incompletely Informed

Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type		Agents No	Interest rates	Agents Type
18	1	Incompletely Informed		43	5	Incompletely Informed		68	6	Incompletely Informed		93	7	Incompletely Informed
19	9	Incompletely Informed		44	3	Incompletely Informed		69	8	Incompletely Informed		94	3	Incompletely Informed
20	1	Incompletely Informed		45	8	Incompletely Informed		70	6	Incompletely Informed		95	4	Incompletely Informed
21	2	Incompletely Informed		46	2	Incompletely Informed		71	9	Incompletely Informed		96	3	Incompletely Informed
22	5	Incompletely Informed		47	1	Incompletely Informed		72	7	Incompletely Informed		97	6	Incompletely Informed
23	6	Incompletely Informed		48	9	Incompletely Informed		73	1	Incompletely Informed		98	9	Incompletely Informed
24	9	Incompletely Informed		49	5	Incompletely Informed		74	2	Incompletely Informed		99	7	Incompletely Informed
25	9	Incompletely Informed		50	2	Incompletely Informed		75	8	Incompletely Informed		100	4	Incompletely Informed

Source: MATLAB Software

Based on the values presented in the table above, the average profit of agents with complete and incomplete information was 5.2857% and 5.0543%, respectively. The low profit margin of the two categories of agents in the medium term indicates the adjustment of profits due to the influence of different parameters. These parameters include what agents are aware of in their forecasts using the fundamental analysis approach, and since these parameters are almost certain to be effective, they may not be seen in the short run, but in the medium and long run the effect is quite clear. Given these parameters, the informed agent makes the decision, the effect of short-term mass behavior may cause these people to change their trading patterns. Especially if the agent does not have a specific long-term plan in place to coordinate with the market direction in the short term and avoid harming the decision-maker like other agents with incomplete information.

These results indicate that if the informed agent does not change his trading strategy under the influence of the short-term market trend, in the medium term, he can offset his loss and possibly gain profits. At this point agents are asked to trade based on the decision algorithm extracted from Expert Chase software. The results of his trading are presented in the following tables in the table below:

Table 6. Results of agents's real trading with forecast for Iran Khodro stock on October 24

Agents No	Interest rates	Agents Type	Agents No	Interest rates	Agents Type	Agents No	Interest rates	Agents Type	Agents No	Interest rates	Agents Type
1	2,530	Completely informed	26	2,810	Incompletely Informed	51	2,680	Incompletely Informed	76	2,660	Incompletely Informed
2	2,580	Completely informed	27	2,770	Incompletely Informed	52	2,760	Incompletely Informed	77	2,810	Incompletely Informed
3	2,570	Completely informed	28	2,840	Incompletely Informed	53	2,800	Incompletely Informed	78	2,820	Incompletely Informed
4	2,520	Completely informed	29	2,860	Incompletely Informed	54	2,670	Incompletely Informed	79	2,890	Incompletely Informed
5	2,620	Completely informed	30	2,740	Incompletely Informed	55	2,710	Incompletely Informed	80	2,740	Incompletely Informed
6	2,570	Completely informed	31	2,790	Incompletely Informed	56	2,790	Incompletely Informed	81	2,850	Incompletely Informed
7	2,690	Completely informed	32	2,720	Incompletely Informed	57	2,710	Incompletely Informed	82	2,790	Incompletely Informed
8	2,940	Incompletely Informed	33	2,890	Incompletely Informed	58	2,810	Incompletely Informed	83	2,780	Incompletely Informed
9	2,760	Incompletely Informed	34	2,670	Incompletely Informed	59	2,810	Incompletely Informed	84	2,800	Incompletely Informed
10	2,910	Incompletely Informed	35	2,680	Incompletely Informed	60	2,670	Incompletely Informed	85	2,780	Incompletely Informed
11	2,840	Incompletely Informed	36	2,690	Incompletely Informed	61	2,950	Incompletely Informed	86	2,950	Incompletely Informed
12	2,840	Incompletely Informed	37	2,680	Incompletely Informed	62	2,710	Incompletely Informed	87	2,750	Incompletely Informed
13	2,700	Incompletely Informed	38	2,800	Incompletely Informed	63	2,920	Incompletely Informed	88	2,690	Incompletely Informed
14	2,860	Incompletely Informed	39	2,780	Incompletely Informed	64	2,910	Incompletely Informed	89	2,850	Incompletely Informed
15	2,700	Incompletely Informed	40	2,730	Incompletely Informed	65	2,800	Incompletely Informed	90	2,790	Incompletely Informed
16	2,840	Incompletely Informed	41	2,730	Incompletely Informed	66	2,770	Incompletely Informed	91	2,730	Incompletely Informed
17	2,690	Incompletely Informed	42	2,900	Incompletely Informed	67	2,750	Incompletely Informed	92	2,780	Incompletely Informed
18	2,870	Incompletely Informed	43	2,950	Incompletely Informed	68	2,950	Incompletely Informed	93	2,910	Incompletely Informed
19	2,730	Incompletely Informed	44	2,880	Incompletely Informed	69	2,760	Incompletely Informed	94	2,950	Incompletely Informed
20	2,700	Incompletely Informed	45	2,710	Incompletely Informed	70	2,940	Incompletely Informed	95	2,730	Incompletely Informed
21	2,710	Incompletely Informed	46	2,820	Incompletely Informed	71	2,890	Incompletely Informed	96	2,880	Incompletely Informed
22	2,890	Incompletely Informed	47	2,880	Incompletely Informed	72	2,840	Incompletely Informed	97	2,840	Incompletely Informed
23	2,670	Incompletely Informed	48	2,770	Incompletely Informed	73	2,890	Incompletely Informed	98	2,670	Incompletely Informed
24	2,700	Incompletely Informed	49	2,670	Incompletely Informed	74	2,910	Incompletely Informed	99	2,720	Incompletely Informed
25	2,770	Incompletely Informed	50	2,930	Incompletely Informed	75	2,920	Incompletely Informed	100	2,930	Incompletely Informed

Source: Research findings

We use two-sample t-test for statistical analysis. Thus, the average price predicted by the two groups of agents is examined at the final market price (2731) in a single sample t-test.

Table 7. Results of a two-tailed t test for Iran Khodro stock on October 24 (full information)

	Variable 1	**Variable 2**
Mean	2510	2731
Variance	200	0
Observations	2	2
Pearson Correlation	#DIV/0!	
Hypothesized Mean Difference	0	
df	1	
t Stat	-22.1	
P(T<=t) one-tail	0.014393344	
t Critical one-tail	6.313751515	
P(T<=t) two-tail	0.028786689	
t Critical two-tail	12.70620474	

Source: Research findings

By examining the t stat value, it is found that the absolute value of the test statistic is greater than the t Critical two-tail, and the null hypothesis that there is no significant difference is rejected. So the forecasted average price values for agents with complete information are significantly different from the market price.

By examining the t stat value, it is found that the absolute value of the test statistic is smaller than the t Critical two-tail, and the null hypothesis that there is no significant difference is not rejected. So the forecasted average price values for agents with incomplete information have no significant difference with the market price.

By looking at the tables above, it is generally seen that agents with incomplete information about agents with complete information performed better and achieved better results. This confirms the results of relation 14-14

in calculating agents' wealth. Influence and market guidance were also acknowledged by agents with incomplete information to bring actual prices closer to their predicted prices.

Table 8. Results of the two-sample t-test for Iran Khodro stock on October 24 (incomplete information)

	Variable 1	Variable 2
Mean	2730	2731
Variance	2432.608696	0
Observations	93	93
Pearson Correlation	#DIV/0!	
Hypothesized Mean Difference	0	
df	92	
t Stat	-0.195526374	
P(T<=t) one-tail	0.422706044	
t Critical one-tail	1.661585397	
P(T<=t) two-tail	0.845412089	
t Critical two-tail	1.986086317	

Source: Research findings

Based on the responses collected after a four-week period, informed agents stated that in order to avoid losses, they changed their strategy and traded between 50 and 70 percent of their stocks without regard to fundamental analysis criteria. However, none of the agents with incomplete information have changed their strategy and continued to use market and technical analysis based on market news and trends.

The reason for the change of strategy was stated by the agents with complete information on loss prevention. While acknowledging that past experience would have been more profitable if they did not change strategy. But they favored the strategy for two reasons:

• Uncertainty about maintaining the current trend and involvement of off-market factors such as sanctions, exchange rate fluctuations, reduced willingness of society to maintain capital in the financial markets, etc.

• Lack of long-term planning by these people to maintain equity in the form of equity or convert capital into equity and the desire to convert capital into cryptocurrencies and other commodities.

This confirms the existence of a mass effect on agents' behavior. In this way, the collective tendency of incomplete information agents to influence prices and this will drive the stock market to predict these agents and consequently make their strategy more profitable in the short run. . Agents have complete information, for the reasons stated, such as market fluctuations, lack of long-term plans, etc., in order to avoid damaging their strategy change, despite knowing that the trading strategy it adopts is correct and it can ultimately benefit him.

5. Conclusion and Policy Recommendations

In the results section of the mathematical theory study, it was recognized that in the short term (one transaction) agents with incomplete information are more successful. This case occurs due to the dominant number of agents with incomplete information. Since in the Grossman relation, the predicted price determines the final market price, with the agents' incomplete information, their predicted price will be more effective. By repeating this process and making virtual transactions with these relationships, we come to the conclusion that agents with incomplete information are still more successful than agents with complete information. But the difference between the two groups will gradually decrease as the number of trades increases. This is also due to the more rational and influential factors being examined in fundamental analysis, not market analysis. After receiving the answers to the questionnaires, the respondents were asked to act according to the strategy stated by them and report back to us. Based on the results obtained from this section, agents with incomplete information will be more successful in the short run than agents with full information. The reason, according to experts and the respondents themselves and the professors, is the dominance of demand and price effects predicted by agents.

Within three weeks of the first transaction, a complete change of strategy is clearly seen by completely informed agents. That is, they will, regardless of their elementary strategy, do all of their trading, regardless of the elements of fundamental analysis, in order to avoid further loss or gain more profit. This phenomenon indicates the existence of herd (massive) behavior among these agents. Although the agents themselves acknowledged that if they were to continue with the initial strategy, they might be able to make more profit from the start-up, they preferred to change their strategy for at least some of the shares they owned. The empirical findings of this article have consistent with theoretical base and similar studies like Baradaran Hassanzadeh et al (2020), Tanzina & Pallabi 2022 and Yaser Almansour (2023).

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Conflicts of interest
The authors declare no conflict of interest

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