



## Trading Behavior of Investors in the stock Market Under the conditions to social responsibility and Behavior biases

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### ABSTRACT

Commitment to social responsibility is the company's duty to achieve long-term goals and an important part of a sustainable society. This is not only related to the survival and sustainable development of the company but also to the expectations of the community and is also an important way to disclose non-financial information of companies. Disclosure of information can effectively reduce information asymmetry, improve the quality of internal control, and influence the trading behavior of investors. Therefore, the purpose of researching the transactional behavior of investors under the conditions of adherence to social responsibility and behavioral bias. For this purpose, the present study was conducted with 90 sample companies in the period 2012-2018. The results illustrated that there is a negative, positive and significant relationship between adherence to social responsibility and short-sightedness and avoidance of bias and there is no significant effect with prominence bias. There is no significant relationship between adherence to social responsibility and transactional behavior, earning returns and risk-taking, and there is a significant relationship with risk aversion. Short-sighted behavioral bias has a minor mediating effect on the relationship between adherence to social responsibility and risk-averse transactional behavior. No mediating effect was found for other biases and information bumps.

### Keywords:

Hearing Behavior, Investors 'Trading Behavior, corporate social responsibility



## 1. Introduction

In recent years, the growth of the capital market has been very rapid, and trading activities in the securities market also show this boom. In the meantime, although financial information can demonstrate the financial situation and operating results of the company in general but very important information other than financial information that cannot be disclosed through traditional financial statements, it needs to help investors meet an accurate understanding of the company's operating situation. In this regard, in recent years, corporate social responsibility has been increasingly considered by various user groups. Increasing the disclosure of non-financial information to improve investment decisions and promote the sustainable development of companies is widely recognized in theoretical and practical circles (Jha, A.; Cox, J 2015, Kim et al., 2014) Adherence to social responsibility is an essential way to protect the interests of corporate v and promote the sustainable development of society.

Empirical evidence shows that different groups in applicant society demand the disclosure of social responsibility by companies. Social responsibility reporting is a tool for holding the company accountable for its performance. Therefore, disclosure of corporate social responsibility attracts the attention of stakeholders and can manage the conflict of interests between different stakeholders in relation to economic, environmental, social, and moral issues. The term corporate social responsibility refers to the emergence of a concept that seeks to take into account environmental and social factors in corporate business decisions, business strategy, and accounting with the aim of increasing social and environmental performance alongside economic factors in a way that is beneficial to the business unit, the community, and the environment. (Yeganeh, Barzegar, 2013)

The theory of legitimacy emphasizes the social relationship between society and the organization, and the organization must report the effects it has on society. According to this theory, the survival of an organization is sustained by market pressures and societal expectations, and therefore understanding societal concerns expresses societal expectations.

At present, corporate management must not only take responsibility for the efficiency of the operations of the company under its control, but also for any action they take that contributes to numerous social

problems. Economic units are forced to accept their social responsibilities, the same as their economic responsibilities. Companies can no longer act as separate economic entities from the wider community; this confirms the importance of social responsibility. Corporate social responsibility is generally recognized as how the company achieves a balance between economic, environmental, and social requirements, while at the same time meeting the expectations of stakeholders and beneficiaries. Corporate social responsibility is a management concept by which companies combine social and environmental issues in their business activities and their interactions with beneficiaries. Organizations that focus on social responsibility can benefit in terms of reputation building. This reputation in the business community increases the company's ability to attract capital and copartner participation. (Badavar nahandi et al., 2014)

On the other hand, successful operation in the stock market, like other economic areas, requires equipping the investor with the necessary knowledge and expertise. A branch of economics that provides individuals with the knowledge and tools needed to analyze financial markets is called financial knowledge. Financial behavior is a branch of financial knowledge that examines the behavior of financial markets with a psychological approach. Stock market behavior is of great importance. Just as financial markets, including the Iranian stock market, can multiply capital and increase profitability; in the same way, they can cause a loss of capital in the short term. Therefore, the behavior of the stock market and other financial markets and understanding the behavior of investors are the main factors of success in these markets. According to the efficient market hypothesis, investors react quite rationally to new information being published in the market, the stock price is reasonably determined and reflects all the information available in the market, and the irrational behavior of the investor has no effect on yield. Also, the arrival of new news and information with the correct reaction of investors and the stock market price to the new news and information shows a quick, complete, and without bias. In inefficient markets, in addition to the fact that news and information are not widely and rapidly disseminated in the market, it is observed that investors' reaction to new news and information is sometimes more than desirable or overreaction and sometimes less than desirable or underreact. Which

causes inequality of real price and market price with each other.

Today, investors have begun to use social responsibility as a factor in making investment decisions. Investors see social responsibility activities as a resource for assessing corporate sustainability. Besides, when the company cannot afford social responsibility, investors assume that the company cannot maintain the stability of its business, and consequently repel investors, and they are reluctant to invest in the company. They will not have. Hence, they will show risk-taking or risk-aversion behavior. Investors are generally interested in investing in companies that carry out social responsibility activities because this is one of the activities that make that company accountable to the community. Therefore, examining the impact of corporate social responsibility on investors' financial behavior can pave the way for linking psychological science with finance.

Given the above, the question arises as to whether adherence to social responsibility can affect the behavioral bias and trading behavior of investors?

### **Theoretical foundations of research**

Many factors affect the likelihood of buying stocks in the market. Obviously, the importance of each factor varies according to the behavioral biases of investors. Some of these factors include company content, profitability, profit stability, price, and macroeconomic and political factors that affect returns and risk. (Ghazizadeh and Khademi Gerashi, 2006) Although profit is an important factor in economic decisions, it is not enough, because this information may be biased. (Hesti, Tri & Ahalik, 2010) A review of previous research shows that other data that may be used is the disclosure of social responsibilities.

Government, consumers and investors are the three factors that require companies to disclose their social responsibilities. Thus, financial markets are considered to react to social responsibility. (Hall, P.L. & Rieck, R, 1998).

(Belkaoui, Ahmed, 1980) also believes that the disclosure of this information in annual reports is increasing and influencing decision-making (Smith, 2005). The social activities of any company can be defined by the society to which it belongs. Price Water Cooper International Auditing Institute (2002) Nearly 70% of executives believe that addressing corporate

social responsibility plays a vital role in the profitability of related companies (Khan, 2010). Therefore, social responsibility has become one of the most important issues in the company's activities. (Rahman et al., 2011)

It has led to the development of a reporting framework and emphasis on providing social and environmental information alongside financial information in recent years. In general, the concept of corporate social responsibility is quite close to the concept of sustainable development, which depends on the three key elements of environmental protection, economic growth and social justice. The rise of interest in exposing corporate social responsibility reflects an increasing demand for transparency. In today's world of cryptocurrencies, cryptocurrencies are becoming increasingly complex, forcing them to process large amounts of information when making decisions. However, judging the quality of information can often be difficult for investors. In the meantime, information on social responsibility is very important for investors. Social responsibility helps to reduce the asymmetric distribution of information among the internal and external persons of the organization as well as reduce the disputes between different groups.

But volunteering in social responsibility activities shows that the system pays good attention to social behavior. The formation and deployment of such effective tactics by managers add to the reputation of the organization. Disclosure of non-financial information performed by social responsibility can effectively reduce the problem of information asymmetry (Gelosten et al., 1983).

In addition, social responsibility can change the internal environment of the company and improve the quality and efficiency of internal control of the company. In fact, information related to social responsibility is believed to help better manage investment risks and strengthen long-term shareholder value and return on investment (Jaworski, 2007).

Short-sighted investors care about short-term performance and trade with short-term profits that may not reflect the value of the company in the long run (Froot et al., 1992).

Expanding the responsibility of the organization implies that in addition to pursuing their for-profit goals, they also consider the general goals and aspirations of society and the social system. Disclosure of social responsibility enables different sections of

society to understand the company's position regarding environmental protection and to examine how the organization pays attention to environmental and social issues (Hasas Yeganeh and Barzegar, 2013).

Therefore, if it is observed that a company engages in unpleasant social activities and the community refuses to approve the company, this will lead to its destruction. Therefore, with the decline of the company's reputation and lack of accountability to their Beneficiaries, investors generally leave the market and show harmful behavior and refrain from investing in companies that are involved in non-social activities.

On the other hand, psychological factors that can affect investor trading behavior are access to information, which is a key factor in intuitive decisions. One of the reasons for access to information is the emergence of the phenomenon of prominence. Highlighting an event in the financial markets is such that investors assume that recent information and events will continue in the future. So, if a company already has a good image in adhering to social responsibility, it still has that company in mind with a positive image and attracts that part of the information more than the other parts and gives it more weight. Information is limited by investors; this behavior leads to cognitive bias. Therefore, they focus only on the part of the information that is available and important to them. Therefore, they care about outstanding information more than its real probability.

(Hong and Stein, 2000) Investors make decisions based on the available information, and only part of the total information is sufficient.

## Research History

(Murashima, 2020) in a study examined "Do investors' reactions to corporate social responsibility news differ according to the type of shareholding?" This study, first, shows different reactions to news announcements related to social responsibility among shareholders.

Findings indicate that individual investors are more sensitive to positive news related to liquidity liability, while institutional investors are more sensitive to negative news and represent one of the reasons for the different results in studies related to social responsibility and the relationship between economic performances. These findings show that news related to social responsibility creates different

behaviors in investors based on purpose, ability and available information.

(De Bortoli et al., 2019) in a study examined personality traits and analyzed investor characteristics. This study examines which of the four patterns best represents the risk that investors display in their financial asset investment decisions.

The paradigms used to explain this research are vision theory, investor profile analysis (IPA), five-factor personality model, and cognitive rehabilitation test (CRT). The results were analyzed using logistic regression and showed that people who are more risk-tolerant according to IPA violate the theory of perspective. They have a high degree of experience and are more likely to use a higher risk in their investment decisions. According to CRT, more than one correct answer in this test is inversely related to risk.

(Hossein, Javad and Sarmad, 2019) in a study examining corporate social responsibility and investors' decision to invest. The results of structural equation modeling illustrate a direct and positive relationship between corporate social responsibility and investor decision to invest.

Tariqul et al. (2017) in a study examining the effect of previous portfolio returns on financial behaviors according to psychological mechanisms concluded that psychological biases affect financial behaviors.

(Sadok and Aymen, 2016) in a study examined the impact of social responsibility on the performance of investment funds in Canada. The results showed that higher social responsibility funds have stronger performance than lower social responsibility funds; these results will help investors in choosing the most profitable fund for investment.

(Marsdenia, 2016) examined the impact of corporate social responsibility disclosure on investor behavior. The results showed that disclosure of social responsibility has little effect on investor behavior.

(Hejazi and Hesari, 2012) in a study examined the reaction of investors to various disclosures of corporate social responsibility. The results showed that the types of disclosure of social behaviors have a significant effect on decision making. In general, adverse disclosure of social behaviors has a significant effect rather than positive behaviors. In a weak financial situation, these behaviors have a significant

impact, but in a strong financial situation, investors pay more attention to positive behaviors.

(Hosseini Chegini, Haghgoo and Rahmaninejad, 2014) in a study examined the behavioral biases of investors in the Tehran Stock Exchange based on the structural equation model. The results show that there is a significant relationship between short-sightedness, optimism, self-attribution, empowerment and retardation biases with investors' investment decisions in Tehran Stock Exchange and behavioral bias does not have a positive and significant effect on investors' investment decisions. (Bozorg Asl and Ahmadi, 2013) in a study examined the reaction of investors to various types of social disclosures of companies. The results showed that investors react to various types of social disclosures. But there is no significant difference between the reaction of professional or non-professional investors and the four types of social disclosures.

### **Research assumptions**

Given what has been said, the research hypotheses are as follows:

Hypothesis 1: There is a significant relationship between adherence to social responsibility and behavioral biases of investors.

Hypothesis 2: There is a significant relationship between adherence to social responsibility and the transactional behavior of investors.

Hypothesis 3: Behavioral biases have a significant effect on the relationship between adherence to social responsibility and investor trading behavior.

### **Research methodology**

The data of this research has been extracted from the audited financial statements of companies listed on the Tehran Stock Exchange, websites such as the Cadal website and the official website of the stock exchange. To determine the statistical sample of the research, the following restrictions should be applied:

- 1) Their financial period ends at the end of March each year.
- 2) The fiscal year does not change during the desired periods.
- 3) The company's shares have been traded in question for at least six months.
- 4) Not to be part of investment, intermediation and financial companies.

- 5) The information required to conduct this research is available during the period under review.

Finally, the financial information of 90 companies was analyzed as a sample in a period of 7 years from 2012 to 2018 by applying the above restrictions as a sample.

### **Data analysis method**

To test the research hypotheses, after screening and selecting a sample from the community of listed companies and collecting information on the variables introduced in the operational definition of variables, using the estimated coefficients of regression patterns of hypotheses, through the Sobel test, the role is significant. Mediator variables are examined.

To perform calculations and prepare data from Excel software and to test regression patterns from Eviews 10 software and to significance of the role of mediating variables in the conceptual model of the research from online calculations Sobel test (1982) has been used.

To test the mediating effect of behavioral bias on the relationship between adherence to social responsibility and investor trading behavior to examine the existence of this relationship with multiple regression analysis in the framework of Sobel, Baron and Kenny tests (1986).

Baron, Kenny, Lahiri and Kadia stated the conditions that reflect the effect of the mediating variable as follows:

Condition 1: the variable or independent variables must affect the mediating variable.

Condition 2: Independent variables must affect the dependent variables in a regression of the independent variable on the dependent variable.

Condition 3: the mediating variable must affect the dependent variable in a regression of independent variables and the mediating variable on the dependent variable (Kamyabi, Shahsavari and Salmani, 2016; Azizi, Shahriar, 2013).

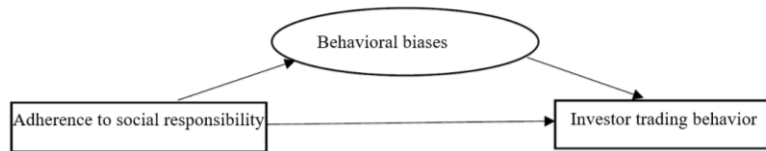


Figure 1. The studied variables in the form of a conceptual model of research

In the Baron method (1986), first, the significance of the independent variable of adherence to the social responsibility of behavioral biases is measured and then without the presence of a mediator variable with the dependent variable of investors' trading behavior is examined. If the coefficients are significant, go to the next step and test the intervention. In this step, the intervening variable is added to the template and checked. If adherence to social responsibility despite behavioral biases has a significant relationship with investors' trading behavior, it can be said that the intervening relationship is minor. But if with the presence of behavioral bias in the model, the effect of adherence to social responsibility on the trading behavior of other investors was not significant; this means that all behavioral biases mediate the effect of social responsibility adherence on investors' trading behavior. The following are the research models for review according to the above three conditions:

**Regression model of the first hypothesis:**

$$Scb_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.1})$$

$$La_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.2})$$

$$Salienc_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.3})$$

**Regression model of the second hypothesis:**

$$CAR_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.4})$$

$$R1_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.5})$$

$$R2_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 LEV_{it} + \beta_3 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.6})$$

**Regression model of the third hypothesis:**

$$CAR_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 Scb_{it} + \beta_3 La_{it} + \beta_4 Salienc_{it} + \beta_5 LEV_{it} + \beta_6 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.7})$$

$$R1_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 Scb_{it} + \beta_3 La_{it} + \beta_4 Salienc_{it} + \beta_5 LEV_{it} + \beta_6 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.8})$$

$$R2_{it} = \beta_0 + \beta_1 \text{CSR - Score}_{it} + \beta_2 Scb_{it} + \beta_3 La_{it} + \beta_4 Salienc_{it} + \beta_5 LEV_{it} + \beta_6 Size_{it} + \epsilon_{it} \quad (\text{eq. 6.9})$$

**7- Research variables**

**7-1-interferer variables**

- **The behavioral bias of the Information prominence:** in order to calculate Information Prominence, 2 equations (1) and (2) are used, respectively. For this matter, returns of stocks and assessed interest of every fiscal year's first season has been estimated using equation (1) and returns of stocks and assessed interest of every year's last season has been estimated using equation (2).

$$R_{it} = \alpha_0 + \alpha_1 NI_{it} + \epsilon_{it} \quad (\text{eq. 7.1})$$

$$R_{it} = \alpha_0 + \alpha'_1 NI_{it} + \epsilon_{it} \quad (\text{eq. 7.2})$$

Then calculated coefficients has been done as below:

$$salienc = \alpha'_1 - \alpha_1 \quad (\text{eq. 7.3})$$

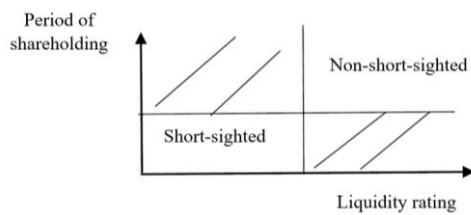
If the number is greater than zero, the number itself and otherwise zero will be assumed.

- **The behavioral bias of the investors' short-sightedness:** if the period between trades (shareholding period) in a company was more than annual average limit of the total stock market and the liquidity rating of stocks was high, stocks would be in the possession of persons that are non-short-sighted in the investing process, otherwise they would be short-sighted.

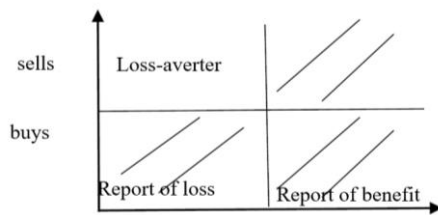
$$(A) = \frac{\text{Volume of trades} \times \text{trading days}}{\text{total issued shares}} \times 365 \quad (\text{eq. 7.4})$$

$$\text{Period of shareholding} = 365 - A \quad (\text{eq. 7.5})$$

At the end, from liquidity rating and period of shareholding, a number was designated according to every year of all sample companies so that for the amounts higher than the average, number one and for all other amounts less than average, number 0 was assigned. Subsequently the calculated amounts were compared so that every two columns containing number one were assigned to one and every two columns containing two zeros or a zero and a one, were assigned to 0 (Rostami et al. 2018).



**-The loss-aversion behavioral bias:** for the calculation of loss-aversion of investors, the reports of loss and gain and the turnover of buy and sell in stock exchange were used. In a way that if a company is non-beneficial and the turnover of the sells is more than turnover of the buys, we will face the behavioral bias of loss-aversion and number one is assigned to it, otherwise it will be zero.



**7-2- Independent variable - adherence to social responsibility**

In this research, according to Carol's hierarchical model (2004; 1991), the efficiency coefficient of social

responsibility has been calculated based on indicators in five economic, legal, ethical, social, and environmental dimensions with data envelopment analysis (Mousavi et al., 2017).

$$\text{CSR - Score} = \frac{\sum_{r=1}^n U_r Y_{r0}}{\sum_{r=1}^m V_i X_{i0}}$$

$$\text{St: } \frac{\sum_{r=1}^n U_r Y_{rj}}{\sum_{r=1}^m V_i X_{ij}} \leq 1, \quad U_r, V_i \geq 0 \quad \text{For each } (j) \text{ company}$$

CSR-Score: Corporate Social Responsibility Disclosure Ratio.

- n: Number of economic dimension indicators
- m: Number of indicators of legal, moral, social, economic and environmental dimensions
- Ur: The weight given to each of the economic dimension indicators
- Vi: Weight given to each of the indicators of legal, moral, social and environmental dimensions
- Yrj: The value of each of the economic dimension indicators for the (j) company
- Xij: The value of each of the indicators of legal, ethical, social, and environmental dimensions for the company j

The ratio of outputs to inputs has been used to calculate the efficiency of companies in terms of disclosing social responsibility.

The solution of the above model by the output-driven BCC model is based on the data envelopment analysis method. The following is a description of each of these dimensions and how to measure them:

- 1. Economic dimension indicators:
  - Tobin's Q: The total market value of a company and the total value of liabilities divided by total assets.
  - Operational cash flow: If the cash flow is positive, it is equal to one and if it is negative, it is equal to zero.
  - Stock market value to the book value of HS (MTB): the ratio of the market value of equity to the book value of equity.
  - Return on Assets (ROA): The result of dividing net profit by total assets
  - Liquidity cycle index: Ugandip model (2012) was used to calculate the liquidity cycle index:
 
$$\text{CCC} = \text{Inv} + \text{AR} - \text{AP}$$

Inventory Retention Time (Inv): [Average inventory divided by the cost of goods sold] × 365

Receivables collection period (AR): [Average accounts receivable on net sales]  $\times$  365

Payment Accounts Payable (AP): [Average Shared Accounts Payable]  $\times$  365

CCC: Liquidity Cycle Index of Efficiency of Financial Resources: 1 minus compound leverage will be used to calculate the efficiency of financial resources.

Composite leverage indicates the rate of change in earnings per share versus a one percent change in sales (Mousavi et al., 2017).

FRE=1 - [Percentage change in sales / Percentage change in profit per share]

## 2. Legal dimension indicators:

Financial leverage: the ratio of total debt to total assets

- Tax avoidance: The absolute value of the deduction of the tax-deductible tax from the declared tax divided by profit or loss before tax.

The ratio of non-executive board members: The result of dividing the number of non-executive directors by the total number of board members of the company.

- Stability of the CEO: If the CEO of the company has changed during the last two years, the virtual variable of zero number, otherwise the number one.

Auditor size: If the audit has been done by the auditing organization, number one, and otherwise number zero (Bahar Moghadam et al., 2013).

- Free-floating stock ratio: The ratio of free-floating stocks was used in the annual announcements of the stock exchange (Abbasi and Marzloo, 2011).

Quality of Disclosure: The quality of disclosure given to each company was used by the Tehran Stock Exchange Organization. The score was calculated based on two criteria of timeliness and reliability.

Institutional ownership: Percentage of institutional shareholders to total shares issued (Yaghoubnejad et al., 2011; Mousavi et al., 2017).

Employer's share insurance: To calculate this variable, the following equation has been used: Amount of cost of employer's share of disclosed notes in the accompanying financial statements divided by the sum of the operating costs and the cost of goods sold.

## 3. Ethical indicators:

Fairness: Honesty, fairness, and respect for the society and the beneficiaries of a company are considered a social value. To achieve this goal, companies are required to adhere to business ethics. Therefore, by the ethical branch of stakeholder theory and the ethical risk of information asymmetry, it is argued that the achievement of unconventional returns in the stock

market indicates information asymmetry that carries ethical risk. This is the moral hazard of unfairness in identifying, measuring, or disclosing information. Therefore, a minus standard deviation of abnormal monthly returns indicates fairness.

Fairness =  $1 - \sigma (AR_i)$

Abnormal Returns: Abnormal returns are the difference between the actual rate of return and the expected rate of return.

$AR_i = R_i - R_m$

$AR_i$ : Abnormal Returns on Securities,  $R_i$ : Real Returns on Securities,  $R_m$ : Expected Returns on Stocks

Optional accruals: Optional accruals can be applied by management.

An ethical manager does not display biased behavior that is in the best interest of the individual using optional accruals.

Because according to the moral branch of stakeholder theory, he prefers collective interests over individual interests, in other words, he behaves morally. Kutari model was used to estimate optional accruals (Rezaei and Mohammadpour, 2017):

$$\frac{TACC_{i,t}}{A_{t-1}} = \beta_0 \left( \frac{1}{A_{t-1}} \right) + \beta_1 \left( \frac{\Delta REV_t - \Delta REC_t}{A_{t-1}} \right) + \beta_2 \left( \frac{PPE_{i,t}}{A_{t-1}} \right) + \beta_3 ROA_{i,t-1} + \varepsilon_{i,t}$$

$TACC_{i,t}$  = Total accruals of business unit  $i$  for year  $t$  and  $\left( \frac{1}{A_{t-1}} \right)$  = Total assets of company  $t$  in the year  $t-1$

$\Delta REC_{i,t}$  = Changes in the receivable accounts of business unit  $i$  for year  $t$  compared to period  $t-1$  minus receivable accounts of business unit  $i$  for year  $t-1$ .

$\Delta REN_{i,t}$  = Changes in the income of business unit  $i$  for year  $t$  minus its income in the year  $t-1$

$PPE_{i,t}$  = Gross of tangible fixed assets  $i$  in the year  $t$ ,  $NDAC_{i,t} = \epsilon_{i,t}$  = Remaining component (non-optional accruals)

After implementing the above regression model, the optional accrual items was calculated using the obtained coefficients from the relationship below:

$$DAC_{i,t} = TACC_{i,t} - NDAC_{i,t}$$

## 4. Social and environmental indicators:

- Employee exchange rate: To calculate the employee exchange rate, the ratio of personnel changes this year to the previous year was used.

Disclosure of environmental information: If using the content analysis of the annual report of the board of

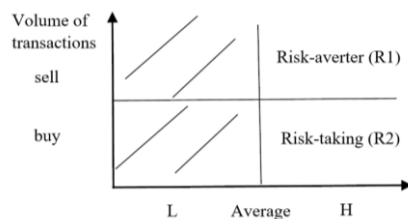


directors, disclosure of information and environmental measures, including measures taken to comply with laws and regulations governing the environmental impact of the company's activities, especially in the field of water resources and Air pollution and emissions, reporting of energy consumption, creating green space, creating a treatment plant and waste disposal and other environmental measures have been done in the company, the virtual variable of disclosing environmental information is number one and otherwise number zero. (Mousavi et al., 2017).

ISO 14001 certification: If the company has succeeded in receiving ISO 14001 certification, the virtual variable related to ISO is number one and otherwise the number is zero (Mousavi et al., 2017).

**7-3- The dependent variable –the transactional behavior of the investors:**

- **The behavior regarding risk:** in order to calculate the behavior regarding risk of the major shareholders, the standard deviation of the annual stock returns to the volume of trades of the stock exchange was used. In the first case if the quantities are greater than the average standard deviation of the annual stock returns and the volume of the purchase transactions is more than the volume of sales transactions, number one is assigned which is assumed to be risk-taking and otherwise if the quantities are less than the average standard deviation of the annual stock returns, number zero is assigned. In the second case if the quantities are higher than the average standard deviation of the annual stock returns and the volume of the purchase transactions is more than the volume of sales transactions, number one is assigned which is assumed to be risk-avertter and otherwise if the quantities are less than the average standard deviation of the annual stock returns, number zero is assigned.



- **The behavior regarding earning returns:** it is calculated using the accumulated abnormal returns which is equal to the monthly abnormal returns that are accumulated through a year (Darabi, 2016).

$$CAR_i = \sum_{t=1}^{12} AR_{it}$$

Abnormal returns: it is the result of the difference between the real return rate and the expected return rate.

$$AR_i = R_i - R_m$$

AR: abnormal stock returns;  $R_i$ : the real return rate of the stock and  $R_m$ : the expected return rate of the stock

**7-4- Control variables:**

- **Size of the company:** using the logarithm of the book value of the total assets
- **Financial Leverage** : total debts divided by total assets

**8- Research findings**

Tables 1 and 2 provide descriptive statistics of the companies in the sample. Considering the virtual risk aversion and risk-taking of investors and their average of 0.159 and 0.129, respectively, it can be found that in this study, the number of years, and companies with risk-averse and risk-averse investors only 16% and 13% shows exemplary companies. The investors' aversion loss variable with an average of 0.063 shows that 6% of the sample companies had loss-making investors. Investors 'short-sightedness variable with an average of 0.448 shows that less than half of the research companies have faced investors' short-sightedness.

The average accumulated abnormal return with a value of 34.522 shows that about 35% of the research companies have achieved a rate of return over the expected rate of return in a year.

The information variability variable of 0.571 indicates that 57% of investors have given significant weight to evidence consistent with their perceptions and have used more prominent information or information that requires less processing. The value calculated for the corporate social responsibility disclosure coefficient is a number between zero and one. The closer the coefficient is to one, means that the company's

efficiency is higher in terms of corporate social responsibility disclosure. In the study of data envelopment analysis output, companies such as Absal, Iran Fiber, Sahand Rubber, Iran Tractor Manufacturing, Elixir Pharmaceuticals,

etc. have the highest social responsibility disclosure coefficient with a value of one and Iran Tractor Manufacturing Company, Axis Khodro, and Zahravi, have the lowest social responsibility disclosure coefficient with a value of 0.000.

**Table 1: Descriptive analysis of values related to virtual variables**

Variables	symbol	Virtual values	Abundance	Frequency	Number of observations
Investors' risk aversion	R1	0	530	0.841	630
		1	100	0.159	
Investors' risk taking	R2	0	549	0.871	
		1	81	0.129	
Investors' Loss avoidance	LA	0	590	0.937	
		1	40	0.063	
Investors' shortsightedness	Scb	0	348	0.552	
		1	282	0.448	

**Table 2: Descriptive statistics of research variables**

Variable	Variable symbol	Average	Standard deviation	Elongation	skewness	Min	Max
Adherence to social responsibility	CSR SCORE	0.212	0.225	6.810	1.986	0.000	1.000
Abnormally accumulated returns	CAR	34.522	65.937	6.777	1.837	-66.628	366.099
Information prominence	SALIENCE	0.571	0.558	2.899	0.670	0	2.741
Financial Leverage	LEV	0.583	0.224	3.254	0.152	0.082	1.566
size of the company	SIZE	27.917	1.564	3.969	0.620	23.616	33.427
<b>Number of Observations: 630</b>							

**8-1- The test results of the research hypotheses**

The results of the first hypothesis test can be seen to examine the relationship between adherence to social responsibility and investor behavioral bias (short-sightedness, loss-avoidance) as described in Table 3. Since the research dependent variable is virtual and is measured as 1 and 0, logistic regression is used. According to the test results, it is observed that the value of the LR statistic, which indicates the significance of the whole regression, is equal to 0.000 and shows that the model is significant. Based on the results, the Z statistic and the significance level of the variable of adherence to social responsibility indicate the significance of the coefficient. This finding shows that there is a significant relationship between adherence to social responsibility and behavioral bias of investors (short-sightedness and loss-avoidance). Therefore, the first condition of Baron and Kenny's framework (1986) is established. To check the

accuracy of the model prediction, the percentage prediction accuracy test was used. In total, the model had 56% and 93% correct predictions. The results of testing the first hypothesis to examine the relationship between adherence to social responsibility and behavioral bias of investors (information prominence) can be seen in Table 3. A coefficient of determination of  $(R)^2$  was used to measure the explanatory power of the model. According to the results of f test, the total regression is less than the five percent error level; therefore, it was ensured that it fits well and is meaningful. According to the results of Table 3, since the significance level of the social responsibility commitment variable is more than 5%, there is no significant relationship between social responsibility commitment and investors' behavioral bias (information prominence). Therefore, the first condition of the Baron and Kenny framework (1986) is not met.

**Table 3. Investigating the Relationship between Adherence to Social Responsibility and Investor Behavioral Bias (Short-sightedness, Aversion, Information Prominence)**

	variable		Coefficient	z	Significance level	
	Short-sightedness	C		8.303	5.118	0.000
CSR_SCORE		-0.103	-0.276	0.022		
LEV		0.566	1.505	0.132		
SIZE		-0.317	-5.431	0.000		
McFadden's coefficient of determination		0.139	LR	34.160		
Significance level		0.000	Log Likelihood	-416.140		
Percentage of prediction accuracy		55.560				
variable		Coefficient	z	Significance level		
loss-avoidance	C		-1.194	-0.387	0.699	
	CSR_SCORE		0.927	1.432	0.012	
	LEV		3.023	4.060	0.000	
	SIZE		-0.132	-1.197	0.231	
	McFadden's coefficient of determination		0.171		21.020	
	Significance level		0.000	Log likelihood	-138.466	
	Percentage of prediction accuracy		93.490			
	variable		Coefficient	T	Significance level	
prominence	C		0.407	0.933	0.351	
	CSR_SCORE		0.144	1.666	0.096	
	LEV		-0.080	-0.885	0.376	
	SIZE		-0.005	-0.330	0.741	
	Determination coefficient		value 0.319	test F limer test	value 91.069	Possibility 0.000
	hausman test				5.367	0.147
	Watson Durbin		2.208	F fisher test	62.728	0.000

The results of testing the second hypothesis can be seen in order to examine the relationship between adherence to social responsibility and investors' trading behavior (risk aversion-related behavior, risk-taking) as shown in Table 4. Since the research-dependent variable is a virtual variable and as 1 and 0 is measured so logistic regression is used. According to the test results, it can be seen that the value of the LR statistic, which indicates the significance of the whole regression, is equal to 0.026 and 0.027, respectively, and shows that the model is significant. Based on the results, the Z statistic and the significance level of the variable adherence to social responsibility indicate the significance of the coefficient. This finding shows that there is a significant relationship between adherence to social responsibility and investor trading behavior (risk aversion). Therefore, the second condition of Baron and Kenny's framework (1986) is established. The results of the Z statistic and the significance level of the variable adherence to social responsibility indicate

the non-significance of the coefficient. This finding shows that between adherence to social responsibility and investor trading behavior) risk-taking (There is no significant relationship. Therefore, the second condition of the Baron and Kenny (1986) framework is not met.

In order to check the accuracy of the model prediction, the percentage prediction accuracy test was used, which in total the models had 84% and 87% correct predictions, respectively. The results of the second hypothesis test to examine the relationship between adherence to social responsibility and investor trading behavior (behavior related to the return on earnings) can be seen in Table 4. To measure the explanatory power of the model, a coefficient of determination of ( $R^2$ ) was used. According to the results of Table 4, the significance level of the social responsibility commitment variable is more than 5%. Therefore, there is no significant relationship between adherence to social responsibility and investor trading behavior (return-related behavior). Therefore, the

second condition of Baron and Kenny's (1986) framework is not met.

The results of the third hypothesis test, the mediating effect of investor behavioral biases (short-sightedness, loss-avoidance, information prominence) on adherence to social responsibility and investors' transactional behavior (return-related behavior) can be seen as shown in Table 5.

According to the results of Table 5, the significant level of investors' behavioral bias (short-sightedness) and adherence to social responsibility indicate the insignificance of coefficients.

This finding shows that there is no significant relationship between investors' behavioral biases (short-sightedness), (adherence to social responsibility and investors' trading behavior), return-related behavior (therefore, the third condition of the Baron and Kenny framework) (1986) is not met. The significance level of investors' behavioral biases (loss of information and prominence of information) and adherence to social responsibility indicate the insignificance of coefficients. This finding shows that among investors' behavioral biases, information

avoidance, and prominence (and investors' trading behavior Behavior-related behavior (there is no significant relationship. Therefore, the third condition of the Baron and Kenny framework (1986) is not met.

The results of the Sobel test (1982) also show that the indirect effect of adherence to social responsibility through investor behavior (short-sightedness, information prominence, and loss avoidance) are  $t = 0.262$ ,  $t = 0.721$ , and  $0.746$ , respectively.  $t =$  on the trading behavior of investors the behavior related to the return of earnings at the level of  $p < 0.793$ ,  $p < 0.471$ , and  $p < 0.456$  is significant.

Thus, adherence to social responsibility through bias (short-sightedness, information prominence, and loss-avoidance) does not affect the transactional behavior associated with earning returns.

According to the results of Table 6, the level of significance of investors' behavioral biases (short-sightedness) indicates the significance of the coefficients. This finding shows that there is a significant relationship between investors' behavioral biases (short-sightedness) and investors' trading behavior (risk aversion-related behavior).

**Table 4. Investigating the Relationship between Adherence to Social Responsibility and Investors' Transactional Behavior (Behavior Related to Return, Risk Taking, Risk Avoidance)**

	variable	Coefficient	Z	Significance level	
Risk aversion-related behavior	C	-0.770	-0.389	0.697	
	CSR_SCORE	-0.310	-0.665	0.006	
	LEV	-0.546	-1.101	0.271	
	SIZE	-0.023	-0.331	0.741	
	McFadden's coefficient of determination	0.103	LR	2.750	
	Significance level	0.026	Log Likelihood	-274.787	
	Percentage of prediction accuracy	84.130			
Risk taking-related behavior	variable	Coefficient	Z	Significance level	
	C	-1.076	-0.497	0.619	
	CSR_SCORE	0.316	0.624	0.533	
	LEV	-0.241	-0.447	0.655	
	SIZE	-0.027	-0.356	0.722	
	McFadden's coefficient of determination	0.102	LR	2.732	
	Significance level	0.027	Log likelihood	-241.341	
Percentage of prediction accuracy	87.140				
Behavior related to returns	variable	Coefficient	T	Significance level	
	C	31.974	0.662	0.508	
	CSR_SCORE	-9.064	-0.834	0.405	
	LEV	-40.612	-3.247	0.001	
	SIZE	1.009	0.604	0.546	
	Determination coefficient	value	test	value	Possibility
		0.221	F limer test	3.045	0.000
Watson Durbin	2.378	F fisher test	4.474	0.004	
		hausman test	1.149	0.765	

**Table 5: Investigating the mediating effect of investors' behavioral bias on adherence to social responsibility and investors' trading behavior (return-related behavior)**

symbol	Coefficients	T	possibility	Determination coefficient	test	value	possibility
C	33.835	0.676	0.499	0.221	F fisher	3.356	0.010
CSR_SCORE	-9.078	-0.834	0.405		F limer	0.000	3.040
SCB	-0.783	-0.146	0.884		Watson Durbin	2.379	
LEV	-40.511	-3.236	0.001		hausman	1.469	0.832
SIZE	0.953	0.555	0.579		F fisher	3.672	0.006
C	33.837	0.698	0.485	0.233	F limer	3.005	0.000
CSR_SCORE	-8.318	-0.692	0.489		hausman	2.226	0.694
LA	-12.199	-1.092	0.275		Watson Durbin	2.385	
LEV	-38.409	-3.144	0.002		F fisher	0.008	3.458
SIZE	0.918	0.532	0.595		F limer	0.000	3.028
C	35.670	0.735	0.463	0.222	hausman	0.835	1.453
CSR_SCORE	-8.232	-0.748	0.455		Watson Durbin	3.375	
SALIENCE	-3.076	-0.675	0.500		F fisher	0.008	3.458
LEV	-41.273	-3.281	0.001		F limer	0.000	3.028
SIZE	0.947	0.566	0.571		hausman	0.835	1.453

While the level of significance of adherence to social responsibility indicates the significance of the coefficient. Thus, the third condition of the Baron and Kenny (1986) framework is established.

The level of significance of investors' behavioral biases (loss aversion) indicates the significance of coefficients. This finding shows that there is a significant relationship between investors' behavioral biases (loss avoidance) and investors' trading behavior (risk aversion behavior).

While the level of commitment to social responsibility indicates the lack of significance of the coefficient. Thus, the third condition of the Baron and Kenny (1986) framework is established.

A significant level of investor behavioral bias (prominence of information) and adherence to social responsibility indicate the insignificance of coefficients.

This finding shows that there is no significant relationship between investors' behavioral biases (information prominence), adherence to social responsibility, and investors' trading behavior (risk-related behavior).

Thus, the third condition of the Baron and Kenny framework (1986) is not met. The results of the Sobel test (1982) also show that the indirect effect of adherence to social responsibility through investor behavioral bias is short-sightedness, loss-making, and information prominence.

t = 0.255, t = 0.603 and t = 0.618 (on investor trading behavior), respectively, Behavior related to risk aversion is not significant at the levels of p<0.799, p<546, and p<0.537. Therefore, adherence to social

responsibility through bias (short-sightedness, prominence of information, and loss avoidance) does not affect risk-related transactional behavior.

According to the results of Table 7, the significance level of investors' behavioral biases (loss avoidance) indicates the significance of the coefficient. This finding shows that there is a significant relationship between investors' behavioral biases (loss avoidance) and investors' transactional behavior related to risk-taking behavior, while the significant level of adherence to social responsibility indicates a significant lack of coefficient. Thus, the third condition of the Baron and Kenny (1986) framework is established.

A significant level of investor behavioral bias (short-sightedness) and adherence to social responsibility indicates the significance of the coefficients. This finding shows that there is a significant relationship between investors' behavioral biases (short-sightedness), adherence to social responsibility, and investors' trading behavior (risk-related behavior). Thus, the third condition of the Baron and Kenny framework (1986) is met.

A significant level of investor behavioral bias (prominence of information) and adherence to social responsibility indicate the insignificance of coefficients. This finding shows that there is no significant relationship between investors' behavioral biases (information prominence), adherence to social responsibility, and investors' trading behavior (risk-related behavior). Therefore, the third condition of the Baron and Kenny framework (1986) is not met.

The results of the Sobel test (1982) also show that the indirect effect of adherence to social responsibility through investor behavioral bias (short-sightedness, information prominence, and loss avoidance) are  $t = 0.22$ ,  $t = 0.584$ , and  $t=0.572$ , respectively. (On investor trading behavior)

Risk-related behavior is not significant at the level of  $p < 0.801$ ,  $p < 0.559$ , and  $p < 0.567$ . Thus, adherence to social responsibility through short-sightedness, information prominence, and loss avoidance does not affect risk-related trading behavior.

**Table 6: Investigating the mediating effect of investors' behavioral bias on adherence to social responsibility and investors' transactional behavior (risk aversion-related behavior)**

symbol	Coefficients	Z	possibility	McFadden's coefficient of determination	test	value	possibility
C	1.022	-0.497	0.620	0.104	LR	2.971	0.041
CSR_SCORE	0.313	0.672	0.040		Log likelihood	-274.676	
SCB	0.106	0.470	0.039		Percentage of prediction accuracy	84.130	
LEV	-0.561	-1.128	0.259				
SIZE	-0.016	-0.217	0.828	0.115	LR	8.045	0.042
C	-0.980	-0.498	0.618		Log likelihood	-271.639	
CSR_SCORE	0.229	0.487	0.626		Percentage of prediction accuracy	84.130	
LA	0.997	2.649	0.098				
LEV	-0.778	-1.533	0.125	0.103	LR	2.860	0.041
SIZE	-0.013	-0.190	0.849		Log likelihood	-274.732	
C	-0.689	-0.345	0.731		Percentage of prediction accuracy	84.130	
CSR_SCORE	0.328	0.699	0.484				
SALIENCE	-0.066	-0.330	0.741				
LEV	-0.559	-1.126	0.260				
SIZE	-0.025	-0.350	0.727				

**Table 7: Investigating the mediating effect of investors' behavioral bias on adherence to social responsibility and investors' trading behavior (risk-related behavior)**

symbol	Coefficients	T	possibility	McFadden's coefficient of determination	test	value	possibility
C	-0.799	-0.364	0.716	0.113	LR	6.426	0.017
CSR_SCORE	0.375	0.734	0.463		Log likelihood	-238.494	
LA	-1.420	-1.935	0.043		Percentage of prediction accuracy	87.140	
LEV	-0.135	-0.248	0.805				
SIZE	-0.037	-0.478	0.633	0.104	LR	2.984	0.039
C	-0.455	-0.205	0.837		Log likelihood	-240.715	
CSR_SCORE	0.311	0.612	0.540		Percentage of prediction accuracy	87.140	
SCB	-0.277	-1.113	0.266				
LEV	-0.205	-0.382	0.703	0.103	LR	2.265	0.029
SIZE	-0.046	-0.590	0.555		Log likelihood	-241.075	
C	-1.270	-0.585	0.559		Percentage of prediction accuracy	87.140	
CSR_SCORE	0.276	0.542	0.588				
SALIENCE	0.156	0.735	0.463				
LEV	-0.206	-0.381	0.704				
SIZE	-0.024	-0.315	0.753				

### 9- Result and discussion

The purpose of this study is the trading behavior of investors in the stock market under the conditions of adherence to social responsibility and behavioral biases between 90 companies listed on the Tehran Stock Exchange during the years 2012 to 2017.

This study investigates the mediating effect of investors' behavioral biases on the relationship between adherence to social responsibility and investors' transactional behavior.

The results obtained from the tests showed a negative and significant relationship between

adherence to social responsibility and behavioral bias of investors' short-sightedness. In principle, corporate social responsibility behaviors are important to investors. It seems that according to the stakeholders, companies with a low degree of commitment to fulfilling social responsibility will face lower market value. Therefore, this affects shareholders who pay too much attention to short-term conditions and cannot trust the distant future and have long-term planning for it. This causes market participants to stop operating and investing in this unfavorable social environment. The results of this research are somewhat consistent with the research of Hussein, Javad, and Sarmad (2019). Adherence to social responsibility has a positive and significant relationship with the loss-making behavioral bias of investors. This finding is consistent with theoretical foundations. Proponents of the theory of financial behavior argue that human behavior is usually defined by a persistent desire to avoid losses rather than ultimate assets. Thus, the behavioral bias of investors' loss-making as part of the vision theory shows that people tend to avoid losses, rather than their tendency to make a profit. It seems that the consequence of the loss-making bias of investors is due to a series of costly activities of adhering to social responsibility and the unstable atmosphere of the Tehran Stock Exchange. Therefore, with the increase in social responsibility activities, we will face harmful behavior avoidance bias. The results of this study are somewhat inconsistent with the research of Debutoli et al. (2019). But adherence to social responsibility does not have a significant effect on the behavioral bias of information prominence. Adherence to social responsibility does not seem to have an effect on investors' perceptions of information, and investors assume that recent information and events will continue in the future. The results of this study are consistent with the 2017 study by Tarikel et al. The results show a negative and significant relationship between adherence to social responsibility and risk aversion trading behavior. By following social responsibility reports, investors focus on the company's profits, taking into account the impact of their investment on the environment and the general public. This strategy creates control mechanisms for additional investment risks and reduces the overall investment risk. Therefore, if the company's activities are more likely to be inconsistent with society's expectations, investors will find it difficult to assess

the existing risk, and this can cause investors to reduce their share of risky assets or exit the market. But social responsibility adherence does not have a significant effect on risk-related trading behavior. The reason for this may be stock market price fluctuations, in which case the positive effects of social responsibility adherence performance on investor behavior occur only when social responsibility adherence performance stays above a certain threshold.

Therefore, investors will be more confident about the level of future risk. The results of this study do not correspond to the results of Deportoli et al. (2019).

Adherence to social responsibility has no significant relationship with behavior and performance related. There does not seem to be a complete lack of social responsibility among Iranian companies, and this has reduced the possibility of abnormal returns for capital market participants based on social responsibility indicators. In addition, the additional costs of monitoring social responsibility performance because Efficiency will also decrease.

Therefore, if these announcements contain informative content, it can affect the behavior of users, especially actual and potential investors, and cause an abnormal return on the market. The results of this study are consistent with the research of Tarikel et al. (2017). As a result, according to the conditions stated for the mediator variable, it can be acknowledged that short-sighted behavioral bias has a partial mediating effect on the relationship between adherence to social responsibility and transactional behavior of investors related to risk aversion. In the case of other behavioral biases (loss of information and prominence of information), no mediating effect was found on the relationship between adherence to social responsibility and transactional behavior related to the acquisition of returns and risk-taking.

Investors' short-sightedness bias seems to partially absorb the effect of social responsibility adherence on risk-averse transactional behavior, and the so-called short-sighted behavioral bias partially mediates the relationship between social responsibility adherences to risk-averse trading behavior. Because short-sighted investors care about short-term profits. So, more reports on social responsibility are attracting these investors. More information generated, directly or indirectly, can help investors better predict and price future returns. Therefore, the reduction of information on adherence to social responsibility indicates that the

company is likely to be in crisis and may face some social problems, which will lead to the loss of investors. As a result, they reduce their trading volume to avoid potential losses and show a high level of risk aversion, leading to a reduction in trading volume.

According to the results of the research, in order to improve the performance of corporate social responsibility, it is suggested to the stock exchange organization to adopt a specific and adjusted framework for accurate measurement of corporate social responsibility so that the level of corporate social responsibility can be accurately checked. It is suggested that the Tehran Stock Exchange Organization adopt rules and regulations that companies in their organizational structure by creating an independent unit or committee of social responsibility, to further improve the level of social responsibility accountability and how to disclose it.

Suggestions for future research are as follows:

- 1) In this study to measure the disclosure of social responsibility from the efficiency of corporate social responsibility performance based on different dimensions of social responsibility based on Carroll theory (2004; 1991) with indicators in five dimensions of economic, legal, ethical, social, and environmental-based on method Data envelopment analysis was performed, it is suggested to use other methods of measuring social responsibility disclosure such as Ernest et al. (1978); Abbott et al. (1979) and...
- 2) In this study, the independent variable of social responsibility was used; It is suggested to use other variables such as profit value relationship and other information quality variables.

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