

## Investigating the effect of information uncertainty on information asymmetry

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### **ABSTRACT**

*One of the effective factors in decision making is appropriate information related to decision. If the required information is distributed asymmetrically among people, it can lead to different results on a single topic. Thus, before the information itself is important to the decision maker, it is the quality of the information distribution that must be evaluated. The present study investigates the effect of information uncertainty on information asymmetry. The information uncertainty characteristic is assessed by the criteria of forecasting dispersion of earnings per share, earnings error of earnings per share, and volatility of stock returns. The method of present study is applied in terms of objective and causal type of descriptive-survey in terms of implementation. It uses panel data regression and fixed effects model for time period. The statistical population of the study is non-financial companies listed on the Tehran Stock Exchange during 2011-2015. The results of a study on 145 companies of the research sample show that information uncertainty has a significant and positive effect on information asymmetry. As this ratio increases in companies, information asymmetry also increases. Based on the theory of information asymmetry, increasing information asymmetry increases incorrect selection in the market and informed intermediaries can increase their income by transferring their confidential information to low-informed intermediaries. The presence of intermediaries leads to mismanagement of liquidity and increases the cost of transactions. Keywords: information uncertainty, information asymmetry, forecasting dispersion and forecasting error of earnings per share, stock return volatility*

### **Introduction**

Information asymmetry is a qualitative concept and to express it in the form of numbers, we need a model to quantify it. For this purpose, Cormier, Houle and Ledoux (2013), we use the bid-ask price range. With increasing the bid prices of buyers and sellers of a company stock, the information influencing their decision will be more different and asymmetric. Based on this model, with increasing the difference in the

bid-ask price of a stock, the information asymmetry will be greater. In testing hypotheses, the absolute value of the number obtained from this model is used (Khodadadi et al., 2015). When information asymmetries about a company stock increase, its intrinsic value will differ from the value considered by capital market investors for the desired stock. As a result, the real value of companies' stocks will differ from the value expected by shareholders (Diamond and Verrichia, 1991). Increasing the difference between the bid and ask prices of stocks is a purely information phenomenon that will be associated with higher information asymmetry. One of the effective factors in decision making is appropriate information related to the issue of decision. If the required information is distributed asymmetrically among people, it can lead to different results on a single topic. Therefore, before the information itself is important to the decision maker, it is the quality of the information distribution that must be evaluated. Concerning information asymmetry, investors show lower tendency to hold stocks with private information. If information uncertainty caused by growth opportunities is mistaken for information asymmetry, companies with higher information uncertainty should provide relatively higher rate of return to attract investors. Also, if investors assume that information uncertainty stems from growth opportunities, stocks with more information uncertainty will be considered as attractive stock for investors, so it will be demanded at a higher price. Given what was stated above and the importance of the subject of this study, the present study aims to answer the question of what is the effect of information asymmetry on information uncertainty.

## **Fundamental principles of research**

### **Information asymmetry**

One of the important points that is always discussed in capital markets, especially stock exchanges, is market efficiency, according to which all information available in the market reflects its effects on stock prices. From the point of view of efficient market hypothesis, the reason for accounting can be attributed to information asymmetry in which one of the parties has more information than the other party. It is caused due to existence of transactions and inside information. Information in the capital market is considered as the basis of transactions, so that the price of securities is directly related to the information available to investors. In 1970s, three scientists in the field of information economics, namely Michael Spence, George Akerlof, and Joseph Stiglitz developed a theory called information asymmetry theory. Information asymmetry refers to a situation in which one of the two parties has more information than the other party. It occurs for several reasons, including the existence of confidential information and transactions (Khodamipour and Ghadiri, 2010). Increasing the quality of auditing is one method to increase the quality of disclosure. Increasing disclosure by company reduces information asymmetry between the company and investors and improves liquidity (Diamond, 1991). Also, information asymmetry caused by low quality disclosure will lead to incorrect selection. Securities facing this problem have lower liquidity and have higher trading costs at the time of buying and selling, so buyers will show lower tendency to buy them. By disclosing private information (even through signaling and their indirect transmission) and improving the quality of disclosure, companies can reduce their information asymmetry that includes stock liquidity (Setayesh et al., 2011).

### **Information uncertainty**

Information uncertainty means ambiguity about the core value of the company that may arise from two different sources: a) intrinsic characteristics of the business or industry, such as technical innovations and high research and development costs. B) Company disclosure procedures, including accounting standards and voluntary disclosure of managers. The presence of confidential information of managers and inaccuracy in the reported information will increase the information risk. The expected return of investors is influenced by information risk. Information risk depends on the amount of confidential information and the inaccuracy of public information reported. With increasing the level of confidential information and reducing the accuracy of the information provided, the return expected by investors will be higher. Since information risk arises from the accuracy of the information provided and the inability of the existing information to estimate the expected return, earnings changes are known as the accounting information risk index. Managers are willing that their forecast on the funded earnings to be realized, if it is not realized, managers

will manage the earnings using tools. Researchers have proven the positive relationship between stock prices and management forecasting error and state that managers' forecasting errors have economic value from the perspective of investors. If earnings are lower than the expected level, the company stock price is likely to fall. Some researchers have also found evidence that suggests when a company current performance is weaker than expected level, company managers will tend to smooth earnings through accruals and transfer future earnings to the current period. When a company current performance is better than expected performance, managers seek to save earnings for future periods through earnings-reducing accruals. It means that companies reduce their earnings in favorable periods so that they can increase earnings in unfavorable periods.

Table 1 presents a summary of the research conducted in this area

**Table 1: research conducted in this area**

Research Results	Year	Researcher	Research title
The results of the study show that there is a direct relationship between information asymmetry and the risk of future stock price falls. Therefore, it can be concluded that with increasing information asymmetry, the risk of future stock price falls increases.	2016	Khodarahmi et al	The effect of information asymmetry on the risk of future stock price falls of companies listed on the Tehran Stock Exchange
The results showed that earnings management in the studied companies has a significant positive relationship with information asymmetry. Also, in an environment of high uncertainty, the intensity of the relationship between earnings management and information asymmetry decreases. In other words, by increasing environmental uncertainty, management reduces information asymmetry by applying more earnings management.	2015	Khodadadi	The moderating effect of environmental uncertainty on the relationship between earnings management and information asymmetry
The results of testing the research hypotheses indicate a significant positive relationship between information asymmetry and equity cost and a significant negative relationship between information asymmetry and earnings quality. The results of this test also reject a significant relationship between earnings quality and equity costs.	2014	Bolu and Hasani Elghar	Investigating the relationship between earnings quality, information asymmetry, and equity cost.
The results of testing the hypotheses showed that operating earnings and operating cash flow have information content to predict stock returns and in this case, the information content of operating earnings is higher than operating cash flow, but in the case of information asymmetry, with increasing information asymmetry, information content of operating earnings decreases operating cash flow increases	2013	Darabi et al	The relationship between operating cash flow and operating earnings and company stock returns and the effect of information asymmetry
The results show that there is a significant relationship between price fluctuations and information asymmetry and between transaction value and information asymmetry. In fact, increasing the volatility limit can increase market efficiency and information symmetry.	2013	Shams and Soleymani Ashrafi	Relationship between price fluctuations and information asymmetry
Their results show that the content of domestic trade information is lower when companies depend on a business group. They also showed that information generation depends on the degree of information asymmetry between internal and external individuals. Finally, they found that domestic transactions take place before earnings announcement; they would have a greater impact on stock prices.	162	Yogesh et al	Investigating the relationship between information asymmetry and the information content of domestic transaction
The results of this study showed that the level of debt of companies that have more information asymmetry is higher compared to other companies. In other words, managers rely more on debt to increase the cost of capital in order to achieve a leverage ratio.	2015	Petacchi	Investigating the effect of information asymmetry on capital structure
The results of this study showed that senior managers' transactions in the form of sales are inversely related to their predictions of future profitability; That is, senior executives take advantage of information asymmetries to their advantage. The research findings also show that after the realization of managers' predictions of the company's earnings, managers' willingness to sell transactions increases.	2014	Kraft et al	investigating the relationship between information asymmetry, senior managers' forecasting of future earnings of company domestic transactions of senior managers

## Methodology

The research method is applied in terms of objective, cross-sectional in terms of time of implementation, quantitative in terms of data type, inductive in terms of logic of implementation, and causal type of descriptive-survey in terms of method of implementation. The statistical population of the study included companies listed on the Tehran Stock Exchange. Since large number of companies listed on the Tehran Stock Exchange and given limited time and high volume of information of all companies listed on the Tehran Stock Exchange, it is not possible to use all companies, so the statistical sample was selected by systematic elimination method.

Table 2 shows the way of selecting and extracting the appropriate statistical sample of the study according to the sampling method, considerations and conditions stated, and data and information available in the stock market.

**Table 2- selection of stock companies studied in this study**

description	number	
Members of the statistical population at the end of 2015	504	total number
Companies that their fiscal year does not end in March.	125	filter
Companies that have had a transaction interruption for more than 6 months.	45	filter
Investment companies, banks and financial intermediaries	165	filter
Companies that their information is not available	24	filter
Total companies excluded from the statistical population	359	total filter
Total statistical sample member companies	145	remaining

**Method of data collection and data analysis:**

In the present study, library and field methods were used to collect information. Also, financial data of Tehran Stock Exchange Organization and information of auditing companies were used. Research data were also extracted from www.codal.ir, Rahavarde- Nowin Software, companies' financial statements and their explanatory notes, independent auditor and legal auditor.

**Research Hypotheses**

**The main hypothesis**

Information uncertainty has a significant and direct effect on information asymmetry.

**Sub-hypotheses**

Sub-hypothesis 1) forecasting distribution of earnings per share has a significant and direct effect on information asymmetry.

Sub-hypothesis 2) Forecasting error of earnings per share has a significant and direct effect on information asymmetry.

Sub-hypothesis 3) Volatility of stock returns has a significant and direct effect on information asymmetry.

Method of testing hypotheses and basic research variables:

In testing hypotheses, the absolute value of the number obtained from this model is used (Khodadadi et al., 2015). This method is as follows:

$$Spread = \frac{1}{D} \sum \frac{(AP - BP)}{(AP + BP) \div 2} \tag{1}$$

Spread = the range of the difference between the bid price of the stock

D: Number of trading days during the year

AP (Ask Price) = the mean of the best daily bid price for the sale of company i stock in the study period

BP (Bid Price) = The mean of the best daily bid price for buying the company i stock i in the study period

Forecasting dispersion of earnings per share: it is the standard deviation of earnings per share forecast in the budget and adjustments made in year t.

Forecasting error in earnings per share: it is the difference between the initial and actual forecasted earnings per share in year t.

Return volatility: is the standard deviation of 3-month returns during the year t, given that companies are required to submit quarterly reports.

Research model:

$$Spread = \alpha_0 + \alpha_1 ForecastDispersion + \alpha_2 ForecastError + \alpha_3 ReturnVolatility + \alpha_4 Size + \alpha_5 LEV + \alpha_6 ROA + \varepsilon_{it} \quad \text{Model (1)}$$

### Data analysis tools and methods

Eviews 8 & Minitab 15 Software is used to analyze the data. Ordinary least squares (OLS) regression results in skewed results and incorrect estimation of parameter coefficients, so panel data regression, fixed or random effects model, and panel least squares (PLS) method are used to test hypotheses. To determine the appropriate model between the pooled model and the fixed effects model, the additional fixed effects test is used. Null hypothesis suggests that the pooled model is appropriate. If the pooled model was preferred, it is done, but if the fixed effects model is preferred, we should test it against the random effects model to determine the appropriate model for estimating, which is done with Hausman test. Null hypothesis suggests the appropriateness of the random effects model. In any selected estimation method, it is better to use the generalized least squares, because more weight is given to observations closer to fitting line and less weight is given to far observations, resulting in more accurate estimates. White method was used to eliminate the variance heterogeneity. Variance inflation factor (VIF) test is also used to determine the correlation between independent variables. If the statistic value is between 1 and 5, there will be no collinearity problem.

## Results

### Descriptive results

**Table 3: Descriptive statistics of variables**

variable name	number of observations	mean	median	max	min	SD
Forecasting dispersion of earnings per share	725	122	86	650	0.00	11.8
Forecasting error of earnings per share	725	44.25	18	35.05	-21.56	4.01
return volatility	725	5.05	4.05	2.18	0.00	4.12
Information asymmetry	725	0.1891	0.1627	0.4829	0.0104	0.0783
Leverage	725	0.6555	0.5675	5.5044	0.0102	0.3505
company size	725	12.2015	11.0454	16.3326	9.0805	1.7212
Return on assets	725	0.1202	0.0977	0.5024	-0.3345	0.1255

Correlation test

**Table 4: Pearson correlation matrix coefficients**

correlation	Forecasting dispersion of earnings per share	Forecasting error of earnings per share	return volatility	Information asymmetry	Leverage	company size	Return on assets
Forecasting dispersion of earnings per share	00.1						
Forecasting error of earnings per share	12.0	00.1					
return volatility	15.0	11.-0	00.1				
Information asymmetry	02.0	01.0	04.0	00.1			
Leverage	15.0	06.-0	10.0	11.-0	00.1		
company size	05.0	11.0	07.0	12.0	58.0	00.1	
Return on assets	05.-0	22.-0	05.0	02.-0	25.0	40.0	00.1

According to the results and the obtained sign for the degree of correlation, the significance and the direction of the correlation between the research variables can be examined in pairs. For example, given the obtained probability for the correlation between information asymmetry and forecasting dispersion of

earnings per share (0.02), this correlation is significant at 99% confidence level and according to the positive sign of its coefficient, it can be said that there is a direct relationship between information asymmetry and forecasting errors of earnings per share. Other numbers of the table are also interpreted accordingly (Table 4)

**F-Limer and Hausman test**

Since the data used in this study are mixed data (year-company) and the mixed data are both panel and pooled, to select one of the panel and pooled data method in model estimation, F-Limer test is used. To evaluate the results of F-Limer test, if the probability of F-statistic is more than 5%, pooled data method should be used. Otherwise, the panel data method should be used. A summary of F-Limer test results is provided in Table (5). As shown, the probability value is 0.00 and less than 5%, so the panel data method is accepted. Given that the panel data method is selected, the Hausman test is performed.

**Table 5: Results of F-Limer test and Hausman test**

model name	F-Limer statistic	significance level	result	Hausman statistic	significance level	result
research model	11.26	00.0	panel	52.24	00.0	fixed effects

As shown in the table, the panel data method and the fixed effects method were selected.

**Regression model assumptions**

Before fitting the model on data, the model presumptions are examined.

**1- Non-autocorrelation test of residues**

In the present study, B-W test was used to determine the presence or absence of autocorrelation. Due to probability above 5% of the test, there is no autocorrelation in the models. Also, Durbin-Watson index was used, and this statistic was between 1.5 and 2.5 in the models, indicating lack of autocorrelation in the models.

**2-Residual variance heterogeneity test**

One of the basic hypotheses of a suitable regression model is the hypothesis of residual variance homogeneity. To test this assumption, Pagan test is used in this study. The null hypothesis in this test is the homogeneity of the residual variance, which is accepted if the probability value is more than 5%. According to Table 6 and since the probability value obtained for the test is higher than the significance level of 5%, the null hypothesis (existence of variance homogeneity) is accepted, indicating that there is no problem of residual variance heterogeneity.

**Table 6: Autocorrelation and variance heterogeneity test**

model name	Autocorrelation statistic value	significance level	result	variance heterogeneity statistic	significance level	result
model (1-3)	56.1	64.0	lack of Autocorrelation	17.1	36.0	no heterogeneity

Source: Research Findings; Eviews software

Results of estimation of regression model with dependent variable of information asymmetry

Testing the research hypotheses is presented as follows. First, to evaluate the effect of research hypotheses, the research model is estimated and the results are as follows:

**Table 7: Hypothesis test results**

Combined regression results with panel least squares method					
Dependent variable: information asymmetry, number of periods: 5, number of sections: 145, total number of panel observations: 725					
variable	coefficient	SD	statistic t	probability	VIF
Forecasting dispersion of earnings per share	153001.7	030065.1	944222.6	00.0	48.2
Forecasting error of earnings per share	353220.4	481090.1	939200.2	00.0	37.1
return volatility	344503.3	450051.1	306472.2	0/00	05.2
leverage	933509.1	426692.0	531392.4	0905.0	55.2
company size	354007.3	660525.0	077789.5	0454.0	45.1
return on assets	676225.1	224437.0	468576.7	0668.0	06.3
constant coefficients	656885.0	450563.0	457920.1	0263.0	-
adjusted coefficient of determination	485130.0	Durbin-Watson statistic		993750.1	
statistic F	40560.19	statistic probability F		00000.0	

Based on Table (7) for information asymmetry, it is observed that the value of F statistic is 19.405 and according to the significance level of this statistic which is equal to 0.000, it is concluded that the H<sub>0</sub> is rejected and the regression equation is significant at the 5% level (also at the 1% level). The t-statistic is used to test the significance of the coefficients of the independent variables in the regression model. According to the figures inserted in Table (7) to test the hypotheses, since the significance level of t-statistic for the variables of forecasting dispersion of earnings per share, forecasting errors of earnings per share and return volatility is less than 5%, there is a positive and significant relationship between the variables of forecasting dispersion of earnings per share, forecasting error of earnings per share and return volatility and information asymmetry. Also, among the control variables, only the variable of company size has a positive and significant relationship with information asymmetry, but no significant relationship was found between other control variables, including financial leverage and return on assets and the dependent variable of information asymmetry. According to the table above, the value of coefficient of determination shows that the change in the independent variables explains 48.5% of the change in the dependent variable.

### Parent test

To investigate the effect of independent variable of information uncertainty on the dependent variable of information asymmetry, the parent test was used in the research model, the result of which is as follows:

**Table 8: Parent test results for research models**

model name	value of chi-square test	probability
model (1-3)	3.95	0.01

Source: Research Findings; Eviews software

According to the results of the parent test and probability of under zero significance of this test in the research model in Table 8 equal to zero at the coefficient is rejected, it can be concluded that in the research model, information uncertainty has an effect on information asymmetry.

### Discussion and Conclusion

The presence of confidential information of managers and inaccuracy in the reported information will increase the information risk. The expected return of investors is influenced by information risk. Information risk depends on the amount of confidential information and inaccuracy of the reported public information. Since information risk arises from the degree of accuracy of the information provided and the inability of the information to estimate the expected return, earnings changes are known as accounting information risk index. In order that earnings to help users assess a company's performance and profitability and investors to estimate their expected returns based on earnings information, the information must be presented in a manner that makes it possible to assess past performance and be effective in assessing the

future activities profitability and forecasting. Thus, reported earnings figure is important for investors and influences their decisions and also earnings stability, as one of the qualitative characteristics of earnings, has a particular importance for investors. Studies have shown that low and stable fluctuations in earnings indicate its quality. Accordingly, investors invest more confidently in the stocks of companies that their earnings are more stable (Ebrahimi and Zakeri, 2009).

Also, the main role of accounting information in financial markets is to provide the necessary conditions for the optimal allocation of resources. Following the recent financial scandals, investors' confidence in the financial reporting system has decreased and the quality of earnings has become as an important factor in determining the credibility and reliability of reported figures. As a result, determining the quality of accounting information and its results has a particular importance for investors, managers, legislators and standards developers (Ahmadpour and Ahmadi, 2008). One of the important points about monetary and financial markets, especially stock exchanges, is market efficiency. According to it, all information in the market reflects its effects on stock prices. Based on efficient market point of view hypothesis, the reason for accounting is the asymmetry of information in which one of the parties has more information than the other party. This is due to the existence of transactions and internal information. Accordingly, the aim of this study is to investigate the effect of information uncertainty on information asymmetry.

The following results were obtained:

### **Testing sub-hypothesis 1**

It was hypothesized that there was a significant relationship between the forecasting dispersion of earnings per share and information asymmetry. As stated in Chapter 3, if the probability obtained for the coefficient of each variable in the right of the hypothesis test model is less than 0.05, the null hypothesis of the t-test stating that the coefficient is not significant at the 95% confidence level is not confirmed. Thus, it can be claimed that there is a relationship between the relevant variable and the dependent variable. Since the probability obtained is less than 0.05 for the first sub-hypothesis, it can be claimed at 95% confidence level that there is a significant relationship between the variable of forecasting dispersion of earnings per share and the dependent variable of information asymmetry. As the coefficient is positive, this relationship is direct.

### **Testing sub-hypothesis 2**

It was hypothesized that there was a significant relationship between the forecasting error of earnings per share and information asymmetry. As stated in Chapter 3, if the probability obtained for the coefficient of each variable in the right of the hypothesis test model is less than 0.05, the null hypothesis of the t-test stating that the coefficient is not significant at the 95% confidence level is not confirmed. Thus, it can be claimed that there is a relationship between the relevant variable and the dependent variable. Since the probability obtained is less than 0.05, for the second sub-hypothesis, it can be claimed at 95% confidence level that there is a significant relationship between the variable of forecasting error of earnings per share and the dependent variable of information asymmetry. As the coefficient is positive, this relationship is direct.

### **Testing sub-hypothesis 3**

It was hypothesized that there was a significant relationship between the return volatility and information asymmetry. As stated in Chapter 3, if the probability obtained for the coefficient of each variable in the right of the hypothesis test model is less than 0.05, the null hypothesis of the t-test stating that the coefficient is not significant at the 95% confidence level is not confirmed. Thus, it can be claimed that there is a relationship between the relevant variable and the dependent variable. Since the probability obtained is less than 0.05 for the third sub-hypothesis, it can be claimed at 95% confidence level that there is a significant relationship between the variable of return volatility and the dependent variable of information asymmetry. As the coefficient is positive, this relationship is direct.



### **Testing the main research hypothesis**

The main hypothesis of the research is that there is a direct and significant relationship between the independent variable of information uncertainty and the dependent variable of information asymmetry. In other words, all sub-hypotheses of the research are accepted, and this relationship is direct due to positive sign of coefficients. Thus, at the 95% confidence level, it can be claimed that there is a significant and direct relationship between the independent variable of information uncertainty and the dependent variable of information asymmetry. Thus, it can be concluded that there is a relationship between information uncertainty and information asymmetry. With increasing this ratio in companies, the information asymmetry also increases. Based on the theory of information asymmetry, increasing information asymmetry results in an increase in incorrect selection in the market and informed intermediaries can increase their income by transferring their confidential information to low-informed intermediaries. The presence of intermediaries results in mismanagement of liquidity and increases the cost of transactions. The results of this study are consistent with those of some studies conducted abroad. For example, Ushman and Morse (1983) and Chiang (1986) investigated the existence of information asymmetries in the period of after announcement of earnings by examining companies listed on the New York Stock Exchange. Lee and Mucklow (1993) also reported high level of information asymmetry in the period of after announcement of earnings by using interlay information. Easley and O'Hara (1992) also found that the volume of exchanges increased in proportion to an increase in information asymmetry, although they did not observe this increase in the period of before announcement of earnings. Examining companies listed on the Toronto Stock Exchange, Libby (2003) reported the existence of information asymmetry in the period of before the announcement of earnings. Wael (2004) also investigated the level of information asymmetry before announcement of earnings by examining companies operating in Euronext Paris. Given the research literature and the results of the present research and testing the hypotheses, it can be stated that the results of the hypotheses of the present research are consistent with those of the studies conducted by Bhattacharai et al. (2008) and Barwa (2006). In their study on listed companies on the New York Stock Exchange, they found that information asymmetry increases as the quality of earnings decreases. Information asymmetry increases the risk of incorrect selection for liquidity suppliers, which can decrease announcement of prices and thus reduce liquidity. They also found that companies with poor earnings quality experience higher information asymmetries when announcing the earnings. Acker (2002) reported a slight difference in the range of the bid-ask price of stocks and an increase in trading volume around announcement of earnings. Libby, Mathew, and Robb (2003) investigated companies listed on the Toronto Stock Exchange and found that the bid-ask price range increased before the announcement of earnings.

### **Recommendations**

Based on the research results, the following recommendations are presented:

- Investors are recommended to consider the criteria related to information uncertainty to reduce the risk of information asymmetry in their investments, and to include the size of companies in their assessments.
- It is recommended that reducing information asymmetry is a desirable general goal for development of standards.
- It is recommended that the stock exchange organization and the auditing organization as a reference for compiling accounting standards pay more attention to that part of financial information that is more manageable and manipulative and the standards that are more involved in this regard than to prevent information asymmetry in the stock market and, consequently, contribute to the ultimate goal of the capital market, which is equitable sharing through appropriate evaluation and assessment.
- Based on the results of the present study, it is recommended that the relevant organizations design a system for assessing and evaluating and disclosing the quality of accounting information so that investors can invest more accurately.
- Investors (as the most important users of information), creditors and other stakeholders of companies are recommended to pay more attention to the ratio of non-operating earnings to make their economic decisions and also to select the optimal portfolio instead of focusing merely only on reported earnings to gain more efficiency and have expectations closer to their forecasting.

- It is recommended that investors, when making their investment decisions in case of information uncertainty, pay attention to the nature of its source and try to distinguish between each of the mentioned sources. The results of the present study also confirm the results of a study conducted by Hua (2011).

Finally, based on the research results, to complete this research and conduct further research in this area, the following recommendations are presented:

- It is recommended that the variables used in this study, along with other variables affecting information uncertainty by different industries in the Tehran Stock Exchange, be tested.

- It is possible to investigate the level of information asymmetry on a daily basis in the Tehran Stock Exchange by using the intraday bids for buying and selling of stocks.

- It is recommended to evaluate the existence of information asymmetry among different industries. For this purpose, it is necessary to categorize companies in terms of type of industry and calculate a specific range of buying and selling stock prices (information asymmetry level) for each industry and investigate the effect of information asymmetry on the volume of exchanges and stock prices in different industries.

### **Research limitations**

Despite inflation in the community, the data were not adjusted based on inflation and may affect the conclusion.

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