AN EMPIRICAL STUDY: INVESTIGATING THE RELATIONSHIP BETWEEN ASYMMETRY OF INFORMATION AND FINANCIAL VARIABLES ON STOCK

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Abstract: In this study, a comprehensive analysis was conducted to investigate the Relationship between Asymmetry of Information and Financial Variables on Stock in listed Companies on Tehran Stock Exchange during 2009 to 2015. The main objective of this research is to identify the various aspects of information asymmetry on financial variables affecting the stock of companies listed on Tehran Stock Exchange and secondary objectives provide a new approach for the development of financial variables affecting the information asymmetry of companies, evaluate the effective financial variables and determine the most important information asymmetry indices among companies in the Stock Exchange. The present research is practical in terms of the purpose, and methodology of the research is descriptive and correlational type. This study is comprised of three hypotheses. To test the hypotheses, the econometric model using panel data has been used for model estimation and hypotheses testing. At first, the Chow test has been used to determine the type of model used in combined data. According to the results, the estimation method of fixed effects for the first and second models and estimation method of random effects for the third model were adopted. Then, the fixed effects in first model and random effects in second model were chosen by using the Hausman test between the fixed effects and random effects models in the first and second models, and the multiple linear regression test has been used in combination form (year-company). The results of this study showed that there is negative and significant relationship between information asymmetry and the rate of return on assets, the ratio of price to earnings per share, and stock price change. The obtained results still remain valid through controlling the variables of control. Ultimately, the results of research hypotheses led to the confirmation of first, second and third hypotheses.

Keywords: Return on assets (ROA), Asymmetry of Information, Tehran Stock Exchange and Financial Variables.

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INTRODUCTION

One of the negative phenomena that typically occur in the stock markets is information asymmetry that leads to the poor economic decisions by investors. Existence of the symmetric information does not create a necessity for raising the economy of information. Because in fact the people in a particular market have no the same information to the desired issue, so people are faced with information asymmetry and the possibility of deviation from the optimal portfolio will be easily possible in this regard. According to the theory of information asymmetry, company executives enjoy the advantage of final information from within the company (Heydari and Mehrani, 2015). With the full knowledge of the company's financial situation and having more awareness to users of financial statements, executives, as responsible for preparing the financial statements, potentially trying to portray a favorable image of the entity, It is also possible that assets and capital of business unit to be reported higher than the normal. The overall result of this operation such would be that the picture of business unit seems better than the real situation and investment motivation in business unit increases among people outside the organization. In this case, an information gap arises between internal and external users that so-called information asymmetry (Khaleqi, 2010). Some users including individuals within an organization such as executives, their analysts and institutions that receive information from these individuals have access to confidential communications (Easley and Ohara, 2004). The more confidential information, the scope difference of offered price of buying and selling stocks among investor's increases and thus the return of investors who do not access to this information reduces (Rafond and Watts, 2008). Also, one of the fundamental preconditions to ensure investors and creditors in the economic productive activities is preparing and presenting information that will be useful in making financial and economic decisions. As the financial decisions should perform based on risk and return, attention to a specified level of risk and return is important. One of the factors affecting the risk and liquidity is shares. Because the liquidity of shares is effective on the decisions of investors in forming the investment portfolio, In other words, rational investors demand a higher risk premium for stocks which have less liquidity (Forouqi and Qojavand, 2012). One of the factors affecting the financial variables is information asymmetry. So, investigate the relationship between financial variables and information asymmetry is felt over and over and can assist investors in making the optimal decisions.

Research Problem

In recent decades, one of the issues which is expanding in the field of economy is information economy. Major discussions in this economy are concerned with the issue of asymmetric information. In conventional or classical microeconomics

issues, the basic assumption which implicitly considered in all theories and economic rules is the assumption of perfect information. This means that there is complete information between economic actors whether on the supply side or on the demand side in a competitive market. But, the above principle has been questioned via raising the theory of Lemmon markets by Akerlof in 1970 that there is asymmetric information between buyers and sellers in the real world and foundation of many microeconomics topics in competitive market was faltered. One of the markets which is strongly influenced by the asymmetry of information is the capital market. The main role of the capital market and the stock exchange as one of the components of this market is attracting and channeling the liquidity in economy to finance in a way that leads to the optimal allocation of scarce financial resources. Achieving to this depends on the existence of an efficient and transparent mechanism through the creation of competitive conditions in the capital market. To create transparency in the capital market, the availability of information is the most important factor. The greater information related to the capital market as transparent which commonly called symmetric information, the effectiveness of this market on economic growth and development will be greater. Attempt to allow equal access to information and information transparency and sovereignty of competition is considered as a step to create the efficiency and resource allocation in the capital market. The use of financial variables affecting the capital market is among the proposed solutions to create information transparency. Based on the above explanation, the aim of this study is to investigate the effects of information asymmetry on financial variables affecting the stock.

When traders are aware of the existence of boards on the market, increase the level of information asymmetry is shown in this case through expanding bid ask spread between buying and selling shares. The bid ask spread of buying and selling shares represents the existing gap between "bid price to buy stock" and "ask price to sell stock". The bid price to buy stock is a price that investor or market maker offer for buying a particular stock. The ask price to sell stock is a price that a seller or market maker offer for selling that stock. Due to increasing the transaction costs, the transaction based on the final information increases the bid-ask spread. This price difference reflects the immediate and direct price and is an index of the trading cost and lack of the market liquidity. The bid-ask spread of stocks is rooted in unusual supply and demand flow which arises from the existence of confidential information in turn. When there is bad confidential news, the supply of stock increases and asks price reduces. On the contrary, when there is good confidential news, the demand and bid price increase (Qaemi and Vatanparast, 2005).

Background of the Research

Jacobson and Accra (2009) comparatively examined the "information asymmetry between the capital markets of Japan and America". Their research results showed that Japan's capital markets reflect information related to future profitability earlier than the America's stock market in stock price. Because of the corporates ownership structure and the widespread presence of institutional shareholders, the Japanese shareholders are better aware of the future prospects of companies compared to Americans ones. By using a simple model, Bollen and Whaley (2004) showed that the bid-ask spread results from slight changes in the stock price, order costs, maintenance costs, incorrect selection and competitive conditions. They expanded a model of the bid-ask spread of market makers and came to this conclusion that the inventory costs have more important than the costs of incorrect selection.

Hughes et al (2005) showed that the high information asymmetry leads to a high risk premium and thus will lead to a higher capital cost.

Lambert et al (2006) examined the relationship between the asymmetry of information, accuracy of information and cost of capital. They suggested that the accuracy of information and information asymmetry distinctly and separately effects on the cost of capital. In an imperfect competition market, information asymmetry affects the willingness to provide liquidity by the market that it affects the companies' cost of capital.

Jing and Kim (2007) examined the "effects of information asymmetry between managers and shareholders in relation to the profitability in terms of timing and amount of". According to the aforementioned study, the level of institutional ownership in Japanese companies increases, the less information asymmetry between managers and other related parties on the market will be available. So, companies that have more inter-company ownership, the market price of stocks encompasses information related to the company's future profitability faster than companies that have less inter-company ownership.

Chang et al (2007) have examined the impact of corporate governance on market liquidity. In this regard, 24 characteristics of corporate governance were considered and the effect of corporate governance on information asymmetry has been estimated with respect to the possibility index of transactions based information and price effects by using the OLS estimate. The results show that companies with better corporate governance have the possibility of transactions based on lower information and the lower price effects and thus, the lower information asymmetry.

Kanagaretnam et al (2007) have examined the relationship between quality of corporate governance and changes in information asymmetry in the capital market. They have used two variables of bid-ask prices gap and depth of the market as index of information asymmetry, and have examined the effect of three mechanisms of corporate governance (board independence, board activities and structure of the board) on these two indicators. Estimation results that have used the ordinary least squares method imply that companies with more independent and more active board have a less increasing in price differences around the seasonal announcements of earnings. In addition, there is a positive and significant relationship between market depth difference, the structure of the board and the board's activities, which suggests that high levels of board structure and greater activity are associated with reducing the information asymmetry.

Byun et al (2008) in a study titled the concept of capital cost of common stock and corporate governance examined the relationship between capital cost of common stock and corporate governance during 2001-2004 in South Korea. Their research findings showed that there is a negative relationship between capital cost of common stock and corporate governance. Protection of investor rights has the greatest impact on reducing the capital cost of common stock. Board of directors and disclosure policy are also important in reducing the capital cost of common stock.

Fu et al (2008) assessed the impact of financial reporting frequency on information asymmetry and capital cost by using the information of companies. The results showed that the more frequency of reporting has been led to a reduction of information asymmetry and capital cost. Also when the mandatory changes were established in reporting frequency, the results did not differ.

Lio (2010) studied the effect of some mechanisms of corporate governance on information asymmetry during 2005 at relation to 500 companies in pharmaceutical, electronics and software industries. He has used a combines scale consisting of six corporate governance mechanisms including board size, board independence, board ownership, the duality of the role of director, the number of board meetings and institutional ownership and given value 1 for a strong corporate governance and value 0 for weak corporate governance. The bid-ask prices gaps and trading volumes have been used as indicators of asymmetry of information in Lio's research, and the relationship between corporate governance on the information asymmetry has been estimated by regression method. The results show a negative and significant relationship between corporate governance index and the bid-ask price gap, and a positive and significant relationship with trading volumes. In other words, the information asymmetry is lower in companies with strong corporate governance.

Rezazadeh and Azad (2008), with investigating the relationship between the scope of the bid-ask price as an indicator for information asymmetry with conservative (standard Basu) through the regression estimate during the period 2002-2006 show that information asymmetry among investors leads to apply the more conservatism in financial reporting. Conservatism in turn reduces the incentive and the ability of managers to manipulate the accounting information and thus reduces the information asymmetry. Nourosh and Ebrahimi Kordlar (2008) in a study examined "the relationship between the composition of shareholders with information asymmetry and usefulness of accounting measures of performance". Findings of this research showed that companies which have greater institutional ownership cover more the stock prices of profit information for future compared with companies that have fewer institutional ownership. This finding corresponds with comparative advantage of institutional shareholders in collecting and processing information. Nourosh and Ebrahimi Kordlar (2009) examined "The role of corporate investors to reduce the information asymmetry in the Tehran Stock Exchange". In this research, investment companies and other commercial establishments were defined as corporate investors. Findings of this research revealed that companies with a high percentage of shareholders have reported additional information with respect to future earnings than the companies with low percentage of corporate investors and thus the greater information asymmetry has been observed in companies with less corporate ownership, and the general results of research show a significant relationship between institutional ownership and corporate information asymmetry.

Qaemi et al (2010) examined the relationship between the seasonal earnings announcements and information asymmetry of markets. The results of their study showed that information asymmetry has not a significant decrease after the announcement of seasonal earnings. Khodami pour and Ghadiri (2010) examined the relationship between accruals and information asymmetry among investors. The results showed that there is a positive and significant relationship between abnormal accruals and information asymmetry, so that with an increase in abnormal accruals, the information asymmetry also increases. Also, there is a negative and significant relationship between stock liquidity, company size, and the proportion of institutional ownership with information asymmetry.

By examining "the relationship between some mechanisms of corporate governance and information asymmetry in companies listed on Tehran Stock Exchange", Rahimiyan and Salehnejad (2010) found that there is no significant relationship between internal audit unit and the proportion of nonexecutive directors of board and measures of information asymmetry. But there is a

significant negative relationship between the percentage of institutional investment ownership and information asymmetry. Also, by comparing the bid ask spread of shares after and before the earnings announcement by using the average test to compare the two ratings was concluded that the level of information asymmetry after the earnings announcement is more than the before one.

Kazemi and Mohammadnejad (2011) in a study "examined the impact of ownership structure on information asymmetry and financial performance of companies". Their research findings indicate that there is a negative and significant relationship between institutional ownership and information asymmetry, such that the level of institutional ownership increases, providing the information by company's managers to relevant people in the market increases as well. In other words, increasing the institutional ownership reduces the information asymmetry which this will lead to efficiency of market in terms of information. Also in aforementioned research, the relationship between ownership of institutional shareholders and a return on shareholders equity has been confirmed and has a positive relationship with the company's financial performance.

Research Objectives

A. Main objective

To Study the effect of information asymmetry on financial variables

(B) Minor objectives of the research

1. To determine the effect of information asymmetry on the rate of return on assets
2. To determine the effect of information asymmetry on the ratio of price to earnings per share
3. To determine the effect of information asymmetry on stock price changes

Research Hypotheses

First hypothesis: There is a negative and significant relationship between the information asymmetry and the rate of return on assets.

Second hypothesis: There is a negative and significant relationship between the information asymmetry and the ratio of price to earnings per share.

Third hypothesis: There is a negative and significant relationship between the information asymmetry and stock price change.

Population and Statistical Sample

The period of testing the study is a five-year period of time according to financial statements from 2009 to 2015 among the selected companies. However, due to the fact that testing the research hypotheses needs to calculate the changes of year (t) compared to the year (t-1), we also need to information in 2008 to calculate some variables. Therefore, statistical population of this research is manufacturing companies listed on the Tehran Stock Exchange during the years 2009-2015 that have the following conditions:

1. Financial information of company should be available during the study period.

2. Company should not be losing during the study period and end of company financial year ending in March and the study period should not be changed in financial year.

3. It should not be among the banks and financial institutions (investment companies, financial intermediation, holding and leasing companies).

4. Company should be listed on Tehran Stock Exchange until the end of 2008 and should not exclude from the Tehran Stock Exchange during the years 2009 to 2015.

5. It should not be passive more than four months on the stock exchange during the time period of the research, because the calculation of the studied market-related variables in the case of aforementioned companies and use them in the research can cause to undesirable effects on the research results. Thus, the number of companies that met the above-mentioned features was 104.

Research Findings

The estimation results of the first research hypothesis

Table 1 shows the results of the research model parameters. For this model, Durbin-Watson statistic is equal to 1,873 that the correlation of disturbing statement is rejected at 5% error level. Probability value related to F statistics is 0.000 to stipulate the model which is lower than 5%. Hence, the H0 hypothesis based on the error of stipulating the model is rejected. As a result, the significance of the model is accepted at confidence level of 95 percent. Coefficient of determination edited the model is equal to 0.874. This statistic indicates that about 87 percent of the dependent variable changes can be described by independent and control variables. Because of not rejecting the statistics of the model, the first hypothesis of the study is investigated.

Table 1
The estimation results of the first research model

Variable	Coefficient	Test statistic	Error probability
Qtobin	-0.002	-2.208	0.028
Company size	0.032	6.892	0.000
MV/BV	0.004	1.988	0.048
Financial leverage	-0.159	-10.693	0.000
Growth	0.000	1.894	0.059
Intercepts	-0.272	-4.406	0.000
Coefficient of determination	0.900874	Adjusted coefficient of determination	0.874
F statistic	34.481	Probability of F statistics	0.000
Durbin-Watson	1.873		

Test the First Hypothesis

The first research hypothesis is formulated as follows:

There is a negative and significant relationship between information asymmetry and the rate of return on assets.

According to the results presented in Table (1), the probability related to the H0 hypothesis based on the effect of information asymmetry on ROA is equal to 0.028, and the coefficient of variable is -0.002; thus, the H0 hypothesis is not rejected at 5% error level. As a result, the information asymmetry on ROA has a significant and reverse impact.

The Results in Relation to the Control Variables

Research results in relation to control variables show that the error level related to company size variables is 0.000, the error level related to size of financial leverage 0.0000, the error level related to the market value to the book value of equity 0.048, the error level related to growth 0.059 that is smaller than to 0.05; therefore, there is a significant relationship between the control variables mentioned and return on assets.

Examine the Quantitative Results of the Second Research Model Estimation

To estimate the second pattern of study, the bound Chow test has been firstly used within the framework of panel data during the period 2009- 2015. This test determines the use of Pooled model or fixed effects model. If the F statistic is significant at 5% error level, the H0 hypothesis (Pooled model) is rejected and fixed effects model will be accepted. Chow test results have been proposed in Table 2.

Table 2
Chow test results (bound F)

Description	F statistic	5% error level
Chow test for evaluating the model	1.554	0.0000

Source: Research results

As seen in table (2), the F-statistic is significant at 5% error level. Therefore, Chow test has strongly rejected the similarity of intercepts in all periods. Thus, the fixed effects model is accepted in this test. Then, the fixed effects method versus the random effects method is tested. Hausman test has been used for this work. If the statistic calculated is significant at 5% level error, the hypothesis of random effects is rejected and fixed effects model will be accepted. To evaluate the selection of estimation method, Hausman test results have been proposed in Table 3.

Table 3
Hausman test results

Description	Test statistic	5% error level
Hausman test for evaluating the model	8.485	0.131

Source: Research results

According to the table (3), the statistic calculated of Hausman test is not significant at 5% error level. Therefore, lack of relationship between individual effects and explanatory variables has been confirmed. Hence, the random effects method will be used to estimate the model.

Test Results of the First Research Hypothesis

Table (4) shows the estimate results of the research model parameters. For this model, Durbin-Watson statistic is equal to 1.706 that the autocorrelation of disturbing statement is rejected at 5% error level. Probability value related to F

statistics is 0.002 to stipulate the model which is lower than 5%. Hence, the H0 hypothesis based on the error of stipulating the model is rejected. As a result, the significance of the model is accepted at confidence level of 95 percent. Coefficient of determination edited the model is equal to 0.029. This statistic indicates that about 3 percent of the dependent variable changes can be described by independent and control variables. Because of not rejecting the statistics of the model, the second hypothesis of the study is investigated.

Table 4
The estimation results of the second research model

Variable	Coefficient	Test statistic	Error probability
Qtobin	-0.169	-2.363	0.019
Company size	-0.589	-0.958	0.339
MV/BV	0.99	2.45	0.015
Financial leverage	-8.234	-5.548	0.000
Growth	0.000	1.228	0.22
Intercepts	22.07	2.583	0.01
Coefficient of determination	0.039	Adjusted coefficient of determination	0.029
F statistic	3.938	Probability of F statistics	0.002
Durbin-Watson	1.706		

Test the Second Hypothesis

The second research hypothesis is formulated as follows:

There is a negative and significant relationship between asymmetry of information and the ratio of price to earnings per share.

According to the results presented in Table (4), the probability related to the H0 hypothesis based on the effect of information asymmetry on the ratio of price to earnings per share is equal to 0.019, and the coefficient of variable is 0.169; thus, the H0 hypothesis is not rejected at 5% error level. As a result, the information asymmetry on the ratio of price to earnings per share has a significant and reverse impact.

The Results in Relation to the Control Variables of Research

Research results in relation to control variables show that the error level related to size of financial leverage variable is 0.0000 and the error level related to the market value to the book value of equity is 0.015 that is smaller than to 0.05; therefore, there is a significant relationship between the control variables mentioned and the ratio of price to earnings per share. But the research results do not show a significant relationship between company size and growth with the ratio of price to earnings per share.

Examine the Quantitative Results of the Third Research Model Estimation

To estimate the third pattern of study, the bound Chow test has been firstly used within the framework of panel data during the period 2009- 2015. This test determines the use of Pooled model or fixed effects model. If the F statistic is significant at 5% error level, the H0 hypothesis (Pooled model) is rejected and fixed effects model will be accepted. Chow test results have been proposed in Table (5).

Table 5
Chow test results (bound F)

Description	F statistic	5% error level
Chow test for evaluating the model	0.1665	1.000

As seen in table (5), the F-statistic is not significant at 5% error level. Therefore, this test rejects the fixed effects method and confirms the use of the Pooled model. Thus, there is no need to perform the Hausman test.

Estimation Results of the Second Research Hypothesis

Table (6) shows the estimate results of the research model parameters. For this model, Durbin - Watson statistic is equal to 1.974 that the autocorrelation of disturbing statement is rejected at 5% error level. Probability value related to F statistics is 0.000 to stipulate the model which is lower than 5%. Hence, the H0 hypothesis based on the error of stipulating the model is rejected. As a result, the significance of the model is accepted at confidence level of 95 percent. Coefficient of determination edited the model is equal to 0.48. This statistic indicates that about 48 percent of the dependent variable changes can be described by independent and control variables. Because of not rejecting the statistics of the model, the third hypothesis of the study is investigated.

Table 6
The estimation results of the third research model

Variable	Coefficient	Test statistic	Error probability
Qtobin	-72.266	-10.633	0.000
Company size	49.797	0.992	0.322
MV/BV	806.837	7.831	0.000
Financial leverage	886.405	8.111	0.000
Growth	0.000	0.457	0.648
Intercepts	-1824.417	-2.373	0.018
Coefficient of determination	0.485	Adjusted coefficient of determination	0.48
F statistic	91.332	Probability of F statistics	0.000
Durbin-Watson	1.971		

Test the Third Hypothesis

The third research hypothesis is formulated as follows:

There is a negative and significant relationship between asymmetry of information and stock price change.

According to the results presented in Table (6), the probability related to the H0 hypothesis based on the effect of information asymmetry on stock price change is equal to 0.000, and the coefficient of variable is -72.266; thus, the H0 hypothesis is not rejected at 5% error level. As a result, the information asymmetry on stock price change has a significant and reverse impact.

The Results in Relation to the Control Variables of Research

Research results in relation to control variables show that the error level related to size of financial leverage variable is 0.0000 and the error level related to the market value to the book value of equity is 0.015 that is smaller than to 0.05; therefore, there is a significant relationship between the control variables mentioned and stock price change. But the research results do not show a significant relationship between company size and growth with stock price change.

Results of Examining the Research Hypotheses

This study examines the effect of information asymmetry on financial variables affecting the stock of companies listed on the Tehran Stock Exchange. In this chapter,

the information has been analyzed. At first descriptive statistics of research variables, then normalizing the research data, and eventually test research hypotheses have been discussed. In general, the following results have been obtained.

Research findings show that there is a negative and significant relationship between information asymmetry and the rate of return on assets. The results also show that there is a negative and significant relationship between information asymmetry and the ratio of price to earnings per share. Also the results show that there is a negative and significant relationship between information asymmetry and stock price change. Results of this study are somewhat consistent with previous researches of Easley and Ohara (1992) [if information asymmetry increases, the trading volume will also increase], Bollen and Whaley (2004) [bid-ask price resulting from small changes in price stock, order costs, maintenance costs, incorrect selection and competitive conditions], Qaemi and Vatanparast (2005) [the information asymmetry effects on stock price, and the stock price has been fluctuated before the period of earning announcement]. Finally, the research results are contrast to researches of Ahmadpour and Rasaiyan (2007) [there is a positive relationship between bid-ask price stocks and volume of monetary transactions, changes in the stock price and size of company assets], Qaemi et al (2010). After the announcement of seasonal profits, the information asymmetry has no significant decrease.

CONCLUSION

The results show that information asymmetry has an effective relationship on financial variables affecting the stock. Results related to the probability of F statistic show that the model is overall significant and has no problem of autocorrelation given the Durbin-Watson statistic. Also it is seen that the F-statistic is significant at 5% error level. Therefore, Chow test has strongly rejected the similarity of intercepts in all periods. Thus, the fixed effects model is accepted in this test. Then, the fixed effects method versus the random effects method is tested. Hausman test has been used for this work. If the statistic calculated is significant at 5% level error, the hypothesis of random effects is rejected and fixed effects model will be accepted. Finally, the statistic calculated of Hausman test is significant at 5% error level. Therefore, lack of relationship between individual effects and explanatory variables has been rejected. Hence, the fixed effects method will be used to estimate the model. Also, the research results in relation to control variables show that the error level related to variables of company size, size of financial leverage, market value to the book value of equity, growth is smaller than 0.05; therefore, there is a significant relationship between the control variables mentioned and return on assets, the ratio of price to earnings per share, and stock price change.

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