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The impact of Environmental Uncertainty on Earnings Management Effect on Information Asymmetry in Companies Listed on the Tehran Stock Exchange

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ABSTRACT

The present Research Aimed to Evaluate the Effect of Environmental Uncertainty on the Relation between Earning Management and the Information Asymmetry. In this way, a Sample Evaluated Including 106 Listed Companies in Tehran Exchange Stock during 2008-2013. To Test Hypothesis, Multivariate Regression and Panel Data were used. To Measure Information Asymmetry, the Proposed Scope of Bid-Ask Spread Was Used Following Venkatesh and Chiang (1986) Model. To Measure Earning Management, an Alternative Variable Called Discretionary Accruals Were Used and Estimated with Modified Jones (1991) Model. The Coefficient of Sale Variation is Also a Proxy Variable of Environmental Uncertainty of the Firms. Findings indicated that Managers by Earnings Management through Discretionary Accruals Reduced Earnings Volatility to react to the Undesirable Effect of Environmental Uncertainty Which is Effective on the Performance and Profitability of the Firms and they tried to hide it From Investors and Creditors Attention by Earnings Management, Which Lead to Increases the Information Asymmetry.

Keywords: Information Asymmetry, Earnings Management, Environmental Uncertainty.

1. INTRODUCTION

By creating and developing increasingly large manufacturing and commercial institutions today, transparent and comparable financial information is the main pillar of informed economic decision-making. Investors, creditors and other users to decide on buying, selling and maintaining stocks, lending and other important

economic decisions they need to relevant and reliable financial information. The main factor in the economic decisions of investors and consumers is transparent financial information. Transparency of information with some bias, information asymmetry and lack of transparency of information, is called information asymmetry. Informational transparency by making equality in opportunities lets creating more motivations for work and investment relative to creating profit or real wealth. If informational asymmetry exist, not only will the information of one of the trade parties be more than the other party about some important features, but also there is the possibility that informed party take advantage of hiding the information. Existing benefit in hiding information and its deployment, is the logic of users of this tool which has many adverse effect on market and its efficacy.

Material mentioned above shows the importance of informational asymmetry subject and its undeniable effect on economic decision makings. Thus the general aim of the study is to determine the amount of influence of environmental uncertainty on severity of profit management on informational asymmetry of listed companies in Tehran stock exchange.

2. LITERATURE REVIEW

In 1970s, three scientists named Michael Spens, George Akerlov and Joseph Stilts founded a theory in economy information which is known as informational asymmetry theory. Informational asymmetry refers to the situation in which, one of the parties involved, has more information than the other. This is due to several reasons, including the existence of transactions and confidential data. Theoretical discussion of information asymmetry has always been of great importance. Sticlits and wise (1981) has an effective role in financial literature and the scope of the role of information asymmetry in credit markets has been widened to the extent that has a significant role in economic policies and borrowing procedures of all economic businesses around the world (Karlan and Zineman, 2006).

Theories show that inequality in information leads to market's failure and this is through tendency to less or more investment would lead to inefficiency in macro and micro levels. More understanding about this concept helps the optimal solutionof that. Two factors contributing to inefficient markets, are improper selection and moral hazard. Improper selection was the first factor of information asymmetry and occurs when one or more of the parties in a real or potential commercial transaction have information advantage over the other parties. This issue gives policy-makers and lenders impetus for the emphasis on the integration of information among the users of the financial statements. Moral hazard is the second factor of information asymmetry based on which, any of the parties in a real or potential transaction is able to his actions in conduction or violation of the condition, while other parties can't see other actions (Scott, 1391).

According to information asymmetry theory presented by Copeland and Gali (1983) two types of trader in the market can be imagined: (a) Informed traders (b) cash traders.

Informed traders set out to do the trade because they deal with confidential information which are not reflected in the price. While cash traders (uninformed investors) only because of liquidity do the exchange. Of course these models refer to the relationship between the difference of sales price and informed individuals in market. Market-makers suffer damage from doing business with informed individuals and they compensate losses through expanding the range of offers to buy and sell stocks. According to this

model of information asymmetry in the market leads to increased range of recommended prices (Copeland and Gale, 1983).

Today, “activity of all organizations and commercial units is influenced by external environmental factors in which organization is active. Organization’s environmental uncertainty is one of such factors. No organization independent from its environment can stay alive. But difficulty and ease of that life relates to the kind of organizations relationship to the environment which in fact that organization is part of that. Managers in response to the environment in which they operate, are flexible and choose to impose opinions, therefore, to deal with environmental uncertainty they face, they have different strategies in advance. Earnings management is one of such strategies (Davila and Waters, 2005).

The corporate executives tend to reduce their reported earnings variability, something that creates information asymmetry of the management and investor. When information asymmetry is high it is likely that opportunistic earnings management volume increase (Triman and Titman, 1988). In addition, the company’s earnings management increases uncertainty about future cash flows (Batacharia et. al., 2009). Finally in uncertain environments (by high sales uncertainty and profits will be determined) it is assumed that detecting earnings management will be hard, because there is instability in the accounting figures and numbers. Accounting standards generally have some degree of flexibility in the choice of accounting methods for earnings management. Managers are often faced with uncertainty when they make opportunistic use of these methods to reduce volatility in reported earnings (Benister and Newman, 1996).

Cormier et. al., (2013) in a study entitled “Effect of earnings management on information asymmetry in an uncertain environment” explored the relationship between earnings management and information asymmetry and the impact of environmental uncertainty on the relationship. Their study included 189 companies in Toronto Stock Exchange in Canada. Their findings showed that there is a significant relationship between earnings management and information asymmetry and environmental uncertainty weakens this relationship.

Bachataria et. al., (2012) in a study entitled “The relationship between earnings quality and information asymmetry” examined the relationship between earnings quality and information asymmetry. The results showed that low quality of earnings leads to increased information asymmetry in the financial markets. Also they found that companies with poor earnings quality, experience higher information asymmetry at the announcement of earnings.

Wasan and Boon (2010) in a study named “Is accruals aggravate the information asymmetry in the market” examined the relationship between accruals and information asymmetry. Findings of the research indicated that there is no significant relationship between the difference of the bid price domain for selling and buying stocks and accruals, which the relationship between the absolute value of whole accruals and the difference of bid price domain for selling and buying stocks was negative and meaningless and the relationship between absolute value of abnormal accruals and the price difference offers to buy and sell stocks is positive and meaningless.

2.1. Hypotheses

According to the research theoretical principle and research literature that stated above, that the two hypotheses are proposed:

H1: Earnings management has a positive effect on information asymmetry.

H2: Environmental uncertainty weakens the positive effect of earnings management on information asymmetry.

3. METHODOLOGY

This research is applied, and since that investigates the relationships between variables using regression analysis its nature is correlation. Data required to calculate each variable of the study, has been extracted from “Tadbir Pardaz” and “Rah Avard Novin” databases. And in a situation with incomplete data in such databases, we referred to archives in stock exchange library and research, development and Islamic studies management website. In this study, information asymmetry is as the dependent variable, earnings management is as the independent variable, environmental uncertainty as moderating variable and beta systematic risk, free float, company’s size, Board independence, task duality, board size, stock liquidity, the variability of stock returns are as control variables.

3.1. Population and Sampling Methods

The study sample contains the listed companies in Tehran Stock Exchange between the years 1387 to 1392 (in order to complete the required information, the information of 1386 is also used). Systematic elimination was used to statistical sample, so all companies in the sample which have the following conditions, would be chosen as the sample and other will be eliminated:

1. Are present in the Tehran Stock Exchange for the years 2008 to 2013.
2. Be among active companies in stock or at least has been active in the studied time period.
3. The financial year end be March 29th of every year.
4. During the time span of the study, does not change the fiscal year.
5. Stop Trading are not more than three months.
6. The necessary data is accessible and available.
7. Not be part of investment companies, financial intermediaries and leasing.

Due to the above conditions and restrictions among the companies listed on the Tehran Stock Exchange, a total of 106 companies were selected.

3.2. Variable of the Study

Dependent Variables

Information asymmetry is a qualitative concept, so that if we want to express it in terms of numbers, we need a model so it can be quantified. In this study following the model of Venkatesh and Chiang (1986) criteria of proposed price range to buy and sell stocks used for this purpose. Which is calculated through model (1).

$$\text{Model (1)} \quad \text{SPREAD } a_{it} = \frac{AP_{i,t} - BP_{i,t}}{(AP_{i,t} + BP_{i,t})/2} \times 100$$

Where:

t = time period studied; i = sample; SPREAD = the difference between the price offered for buying and selling stocks; (ASK PRICE) $AP_{i,t}$ = mean of an offer to buy the company's stock i in period t ; (BID PRICE) $BP_{i,t}$ = mean of an offer to sell the company's stock i in period t .

The is that first we extract the best proposed price for buying and selling each share for 21 days before and after estimated profit for any of companies in the sample during the year. The best proposed price for buying share is the highest proposed price for buying share in each day and the best proposed price for selling is the lowest proposed price to sell each share in each day. Then based on the model, the average of the figures calculated for different days of any of years under studied for sample companies, was considered the range of difference between proposed price for buying and selling the shares of that company during that year.

3.3. Independent Variable

The independent variable of this research, is earnings management. And are used as a measure of earnings management. In this research to calculate optional accruals, the modified Jones model (1991) is used. This model has been used in several investigations.

In this study, the total accruals is calculated through the model (2).

$$\text{Model (2)} \quad TA_{i,t}/A_{i,t-1} = b_0(1/A_{i,t-1}) + b_1(\Delta REV_{i,t}/A_{i,t-1}) + b_2(PPE_{i,t}/A_{i,t-1}) + \epsilon_{i,t}$$

Where:

t = time period studied; i = sample; $TA_{i,t}$ = Total accruals company of i in year t , (which is equal to the difference between operating profit and operating cash flow); $A_{i,t-1}$ = book value of total assets of the company i in year $t-1$; $\Delta REV_{i,t}$ = sales income changes of the company i during the year $t-1$ to t ; $PPE_{i,t}$ = gross tangible fixed assets of company i in year t ; $\epsilon_{i,t}$ = model error of company i in year t .

The coefficients obtained from the model (2) are used in model (3), and non-optional accruals (NDA) is calculated through the model (3).

$$\text{Model (3)} \quad NDA_{i,t} = b_0(1/A_{i,t-1}) + b_1\{(\Delta REV_{i,t} - \Delta REC_{i,t})/A_{i,t-1}\} + b_2(PPE_{i,t}/A_{i,t-1})$$

Where:

$\Delta REC_{i,t}$ = change in receivable accounts and receivable documents of the company i in year $t-1$ to t

From the difference between the accrual and non-optional accruals, optional accruals (DA) is calculated through the model (4).

$$\text{Model (4)} \quad DA_{i,t} = TA_{i,t}/A_{i,t-1} - NDA_{i,t}$$

Moderating Variable

Mediating variable in this study, is environmental uncertainty. To determine the environmental uncertainty coefficient of variation in sales is used. Which is calculated through model (5).

$$\text{Model (5)} \quad cv(\bar{x}_i) = \frac{\sqrt{\sum_{k=1}^6 \frac{(\bar{x}_i - \bar{x})^2}{6}}}{\bar{x}}$$

Where:

ε = sales amount reported in the statement of profit or loss;

ε' = Average sales account during the study period.

Control Variables

- **Firm size:** to quantify and measure the size of the company, natural logarithm of total assets book value is used.
- **Board independence:** Board independence equals to the number of non-bound members of the Board divided by the total board members.
- **CEO Chair:** is a virtual variable if the chairman of the board and CEO is the same number 1 otherwise 0.
- **Board size:** Board size is equal to the logarithm of the number of members of the Board.
- **Board size squared:** Square board members is equal to the number of board members power 2.
- **Free Float:** Free float share is equal to the number of free float shares at the end of the year divided by the total number of shares of the company. In this study, the free float of each company in the sample is extracted from the web site of the Tehran Stock Exchange.
- **Standard Deviation:** Share standard deviation is equal to stock systematic risk and in order to measure stock systemic risk β index is used which is calculated the model (6).

$$\text{Model (6)} \quad \beta_i = \frac{\text{COV}(R_{i,t}, R_{m,t})}{\delta R_{m,t}}$$

Where:

β_i = beta of the company's stock I; $R_{i,t}$ = Return On Asset (stock) of company i at time t ;

$R_{m,t}$ = is the market portfolio return in time t . which is calculated based on the model (7):

$$\text{Model (7)} \quad R_m = \frac{I_t - I_{(t-1)}}{I_{(t-1)}}$$

Where:

$R_{m,t}$ = is market portfolio return at time t ; I_t = stock market index in year t ; $I_{(t-1)}$ = stock market index in year $t-1$

In this study, β of each companies in the sample is extracted from Rah Avard Novin software databases.

- **Stock liquidity:** In this research, trading volume is used as a measure of liquidity stock. And is calculated through model (8):

$$\text{Model (8)} \quad \text{VOL}_{i,t} = \frac{1}{D_{i,t}} \sum_1^{D_{i,t}} \text{VOLUME}_i$$

$VOL_{i,t}$ = average daily trading volume of the shares of the company i in year t ; $D_{i,t}$ = the number of days of the year t in which the i company's stock is traded; $VOLUME_i$ = turnover of the company i on a daily basis

- **Stock Returns Change:** In this study, a measure of daily stock returns as a measure of the variability of stock returns used and is calculated by model (9).

$$\text{Model (9)} \quad \text{STDRET}_{i,t} = \sqrt{\frac{1}{D_{i,t} - 1} \sum_1^{D_{i,t}} (R_i - \bar{R})^2}$$

Where:

$\text{STDRED}_{i,t}$ = variability (standard deviation) of company I stock returns in year t ; R_i = is the i company's daily stock returns which is calculated based on the model (10); \bar{R} = arithmetic average of daily stock returns; $D_{i,t}$ = number of days of the year t for which the company i daily stock returns is calculated.

$$\text{Model (10)} \quad R_i = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where:

P_t = closing price of the day t ; P_{t-1} = closing price of the day $t - 1$

4. FINDINGS

4.1. Descriptive Statistics of Study Variables

In order to gain a better understanding about population and variables, summary of statistics of variables in are presented Table 17.1.

Table 17.1
Descriptive Statistics for models' variables

Variable name	Symbol	Average	Mean	Max	Min	SD	Skewness	Kurtosis
Board Independence	INDDIR	57/0	61/0	00/1	00/0	35/0	-73/0	33/3
Size of the Company	SIZE	87/5	69/5	16/8	30/4	58/0	85/0	27/4
Information Asymmetry	SPREADA	75/1	81/1	35/7	00/0	92/0	83/0	44/5
Stock Returns Change	STDRET	12/0	11/0	42/3	14/0	004/0	28/19	18/432
Systematic Risk Beta	SYSRISK	72/1	57/1	01/3	20/0-	87/0	38/0	82/1
Stock Liquidity	VOL	40/134	45/101	06/1684	72/0	45/1	64/5	44/7
Earnings Management	ABSDACC	09/0	07/0	82/5	78/0	12/0	13/3	12/17
Board Size	BODSIZE	55/4	55/3	00/7	00/3	51/0	43/5	35/40
Board Size Squared	BODSIZESQR	32/20	35/10	00/49	00/9	88/3	25/3	10/24
Task Duality	CEOCHAIR	56/0	54/0	00/1	00/0	44/0	13/3	41/24
Environmental Uncertainty	ENV	47/0	38/0	57/16	15/0	45/1	67/7	31/68
Free Float	FFLO	13/0	22/0	85/0	08/0	23/0	95/0	69/3

4.2. Pattern Selection for Study Models

Due to the fact that data used in this study is combined and mixed data is both tabulated and synthetic, thus F Limer test was used to choose between data tabulated and synthetic methods to estimate the models. To check the results of F Limer, if F-statistic possibility is greater than 0.05, you should use the synthtic approach. Otherwise, the tabulated sata method is used. Given that both the *p*-value are equal to zero and less than 05/0, so in both models, tabulated data methods is accepted.

Given that the tabulated data is accepted, for regression models, Hausman test must be used for the tabulated data type (using fixed effects or random effects). To check Hausman test results, if the probability of the chi-square statistic is more than 0.05, random effects methods must be used. Otherwise the fixed effects model is used. Given that both the *p*-values are equal to 0.02 and less than 0.05, thus using fixed effects will be accepted.

In this study, Watson – Durbin test is used to detect the presence or absence of auto-correlation. If this amount is about 2, there is no auto-correlation Otherwise there is an auto-correlation. Due to the fact that Durbin – Watson statistics amount of the first model is equal to 2/24 and the second one is 1/69 and the amount of both are between 1.5 to 2.5, both models don’t have auto-correlation.

In this study, the White test is used for residual variance consistency. Null hypothesis in this test is residual variance consistency which if *p*-value is more than 0.05, the null hypothesis is accepted. Due to the fact that *p*-value for white test in first model is 0.13 and in the second one is 0.27, and both models values are more that significance level 0.05 (*p*-value ≥ 0.05), null hypothesis (variance consistency presence) is accepted which shows that in both models there is no problem for residual variance consistency.

4.3. Hypothesis Testing Results

H1: In the first hypothesis, the relationship between earnings management and information asymmetry is discussed. The results of the first hypothesis are in Table 17.2.

Table 17.2
Analysis of data results to test the first hypothesis

$$SPREAD_{i,t} = \beta_0 + \beta_1 SYSRISK_{i,t} + \beta_2 FFLO_{i,t} + \beta_3 ABSDACC_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 INDDIR_{i,t} + \beta_6 CEOCHAIR_{i,t} + \beta_7 BODSIZE_{i,t} + \beta_8 BODSIZESQR_{i,t} + \beta_9 VOL_{i,t} + \beta_{10} STDRET_{i,t} + e$$

Variable name	Symbol	Coefficient	SD	T statistics	P-value
	β_0	-30/4	98/0	-77/4	00/0
Systematic risk Beta	SYSRISK	07/0	01/0	79/5	00/0
Free Float	FFLO	95/0	32/0	60/3	00/0
Earnings management	ABSDACC	32/0	12/0	19/2	03/0
Size of the company	SIZE	50/0	04/0	01/17	00/0
Board Independence	INDDIR	35/0	08/0	62/3	00/0
Task Duality	CEOCHAIR	-11/0	03/0	-45/4	00/0
Board size	BODSIZE	60/6	89/1	32/4	00/0
Board size	BODSIZESQR	-05/0	02/0	-32/3	00/0
Stock liquidity	VOL	-05/2	48/0	-30/4	00/0
Stock Returns Change	STDRET	84/18	71/10	80/1	04/0
Determination coefficient			0.72	T statistics	24.7
Modified Determination coefficient			0.71	Prob (F-statistic)	00/0

As can be seen in Table 17.2, according to the p -value obtained for F statistics which is equal to zero (p -value ≤ 0.05), H_0 is rejected, and this shows that the all regression coefficients are not simultaneously zero. So there is a significant relationship between all independent variables and the dependent variable at the same time.

According to Table 17.2 and the t statistic p -value for the earning management variable (ABSDACC) which is equal to 0.03 and is less than the level of error 0.05 (p -value ≤ 0.05), null hypothesis (assuming no impact of earnings management on information asymmetry) is rejected and the conclusion is that the earning management affects information asymmetry. As a result, the first hypothesis is not rejected. Based on the variable earning management coefficient which is positive and equal to 0.32, we conclude that earning management has positive effect on information asymmetry. According to the t statistic p -value for other variables, all variables are significant and affect the information asymmetry. Model Modified R^2 value is equal to 0.71, which shows that 71 percent of changes is explained by the independent variables; in other words 71% of the variability of dependent variable is related to independent variables.

H2: The second hypothesis explores the impact severity of environmental uncertainty on earnings management based on information asymmetry. The results of the second hypothesis are presented in Table 17.3 below.

Table 17.3
Analysis of data results to test the second hypothesis

$$\text{SPREAD}_{i,t} = \beta_0 + \beta_1 \text{SYSRISK}_{i,t} + \beta_2 \text{FFLO}_{i,t} + \beta_3 \text{ABSDACC}_{i,t} + \beta_4 (\text{ABSDACC} \times \text{ENVUNC}_{i,t}) + \beta_5 \text{ENVUNC}_{i,t} + \beta_6 \text{SIZE}_{i,t} + \beta_7 \text{INDDIR}_{i,t} + \beta_8 \text{CEOCHAIR}_{i,t} + \beta_9 \text{BODSIZE}_{i,t} + \beta_{10} \text{BODSIZESQR}_{i,t} + \beta_{11} \text{VOL}_{i,t} + \beta_{12} \text{STDRET}_{i,t} + e$$

Variable name	Symbol	Coefficient	SD	T statistics	P-value
	β_0	-49/0	32/2	-29/0	60/0
Systematic risk Beta	SYSRISK	02/0	02/0	30/0	70/0
Free Float	FFLO	-56/3	11/2	-23/1	19/0
Earnings management	ABSDACC	54/0	07/0	33/6	00/0
Earnings management \times environmental uncertainty	ABSDACC \times ENV	92/0	32/0	37/4	00/0
Environmental uncertainty	ENV	23/0	04/0	47/7	00/0
Size of the company	SIZE	34/0	47/0	80/2	01/0
Board Independence	INDDIR	-18/0	08/0	-12/1	30/0
Task Duality	CEOCHAIR	13/0	27/0	50/0	57/0
Board size	BODSIZE	-32/1	21/1	-30/1	17/0
Board size	BODSIZESQR	-11/0	006/0	-24/1	05/0
Stock liquidity	VOL	-88/3	82/0	-34/3	00/0
Stock Returns Change	STDRET	18/1	38/0	32/3	00/0
Determination coefficient			0/72	T statistics	9/2
Modified Determination coefficient			0/68	Prob (F-statistic	00/0

According to the p -value obtained for F statistics which is equal to zero (p -value ≤ 0.05), H_0 is rejected, and this shows that the all regression coefficients are not simultaneously zero. So there is a significant relationship between all independent variables and the dependent variable at the same time.

According to Table 17.3 and the t statistic p -value for the reciprocal effect of earning management on company's environmental uncertainty variable ($ABSDACC \times ENV$) which is equal to 0 and is less than the level of error 0.05 (p -value ≤ 0.05), null hypothesis (assuming no impact of environmental uncertainty on the relationship between earnings management and information asymmetry) is rejected and the conclusion is that environmental uncertainty has effect on the relationship between earnings management and information asymmetry. As a result, the second hypothesis is not rejected. According to the t statistic p -value for interaction variable of earning management on environmental uncertainty which is (4.37) and is less than t statistics value of earning management (6.33), we conclude that environmental uncertainty leads to weakness of positive effect that earning management has on information asymmetry.

According to the t statistic p -value for other variables, earnings management, environmental uncertainty, firm size, square board size, the liquidity of stock and Stock Returns Change are significant and have influence on information asymmetry.

Adjusted R^2 value of the model is 0.68, which indicates 68 percent of dependent variable changes can be explained by the independent variables; in other words 68% of the variability in dependent variable is related to the independent variables.

5. CONCLUSION

In this study, the environmental uncertainty impact on earnings management effect on information asymmetry was studied. The findings indicate a significant positive relationship between earnings management and information asymmetry. So earnings management leads to increase information asymmetry between investors in the Tehran Stock Exchange. In addition, these findings suggest that environmental uncertainty has weakened the positive effect of earnings management on information asymmetry. The findings of this study suggest that environmental uncertainty undermines the relationship between information asymmetry and earnings management. As mentioned earlier in this study, Kermier et. al., (2013) found that there is a positive and significant relationship between earning management and information asymmetry and environmental uncertainty weakens this relationship. Findings of this study show that environmental uncertainty weakens the relationship between information asymmetry and earnings management. The results of Bachtiar (2008) showed a significant positive correlation between abnormal accruals and information asymmetry.

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