



Studying the effect of earning management on information asymmetry in uncertainty conditions in Tehran Stock Exchange

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ABSTRACT

When information transfer is done unequally and asymmetrically among the individuals, different results may be created for the same issue. Information asymmetry may have undesirable outcomes such as market efficiency reduction, exchange costs' increase, market weakness, low liquidation, and on the whole, a reduction of earnings resulted from exchanges in capital markets. Accordingly the present research is going to study about the effect of earning management on information asymmetry in uncertainty conditions in firms enlisted in Tehran Stock Exchange. In this research 120 firms enlisted in Tehran Stock Exchange during the time period between 2009 and 2013 have been investigated. To test research hypotheses we have used panel data linear regression model. Research findings showed that in a complex and dynamic environment, there has not been a meaningful relationship between earning management and information asymmetry but overallly (without dividing the complex and dynamic populations) there has been a positive and meaningful relationship between earning management and information asymmetry.

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1. Introduction

Earning report is one of the items in financial statements that have been noticed as a criterion to measure the performance and profitability capability of a profit unit. But the calculation of net earnings in a profit unit is affected by accounting methods and estimates. The authority of managers in using realization principles and adjustment, estimation, and prediction, also the application of methods such as inventory assessment method change, depreciation of rent, current costs, or capital cost of research and development costs and the identification of the cost of uncertain claims are among items that managers can change earnings through implementing them. On the one hand, due to higher information level of managers regarding the firm's status, it is expected that the information be supplied and presented in a way that reflects the firm's status in its best form. On the other hand, due to reasons such as survival in the company, being rewarded and ..., the management in a profit unit may show the firm's status desirable by earning management whether he likes or not to do so. In such situations, the real earning will contradict with the one reported in financial statements and an incident like earning management has happened (Namazi & et al, 2010). On the other hand, the quality of reported information has been approved regarding financial decisions in previous researches. Meanwhile, information asymmetry among

different investors as one of indexes of financial reporting quality means that some of exchange partners may have more information advantage over the others and previous studies have shown that this can lead to financial reporting quality reduction. Thus, to answer the research questions here, we will deal with statement of the problem, research literature, models and variables' measurement type, and finally refer to research findings and conclusion.

Theoretical foundations of the research

Currently accounting plays an important role in economic systems. Precise decision making by the individuals, firms, government, and others for appropriate distribution and the efficiency of financial resources are inevitable issues. For this type of decision makings, the decision makers should have access to reliable information. In fact, the goal of accounting is to help these decision makers. On the other hand, investment is among necessary and principal issues in country's economic growth and development processes. Practically it has been proved that people have access to different levels of information and knowledge. The information they possess affects their behaviors in different positions. For example, when purchasing goods, the salesperson usually determines the price of goods based on his knowledge and information about the price of other similar goods in the market and its conditions. Also the purchaser can have similar information about the market prices. But the purchaser's information about the goods'

quality is not equal to the salesperson's information and the salesperson has more complete information about it (Babaei, 2012).

Thus, it is clear that there should be information asymmetry between these two parts of the participants in the market. Based on Scott's view when one of the two parties in an exchange has information advantage over the other, it is said that the economic system is asymmetrical regarding the information. Maybe regarding efficient market theory, the reason for the existence of accounting can be attributed to information asymmetry where one of the participants in an exchange has more information compared to the other party. On the other hand, accounting accruals change cash flows into net earnings without considering incidence time by adjusting the costs and incomes resulted from a financial period. Additionally, accruals may have deviations due to conscious manipulations of management (earning management) and the implementation of personal outlooks. Therefore, the investors should incur a considerable cost to process information in order to get a complete perception of value meaning of the accruals. Investors that act slowly in understanding the real economic value of accruals in current year would not have a correct understanding of the value of accruals. The incorrect validation of accruals represents the fact that the investors are not able to understand the information in accruals commonly.

Thus, a certain group of informed investors such as individuals within an organization would be able to exploit this incorrect validation of accruals to direct their business activities towards profits. Regarding what was pointed out, it can be expected that accruals may cause information incongruence in the market which leads to increase the difference between suggested prices. Hence, it is expected that by increasing accruals, the range of differences in purchase and sales prices for the stocks will increase either (Khoddampour & Ghadiri, 2010).

The goal of management is to show the firm consistent and dynamic in the minds of investors and capital market. The achievement of a proper position among the rivals and capital market leads the investors and creditors to have more positive ideas about the firm and thus the company will not need to spend more in competing with other similar companies and it receives credit and loans with a lower cost level. Experimental evidences have shown that managers in profit units may use artificial methods such as using discretionary accruals or real ones such as manipulating the time and amount of sales incomes to smoothen earnings because the existence of a consistent growth pattern in earnings in a firm has information advantages for the investors and other beneficiaries regarding firm's information and their abilities will potentially increase in predicting future revenues (Habib & et al, 2011). In earning management, managers utilize their authorities based on the standards and rules or exchange structures in a way that the firm value does not decline and they manipulate earning along with it (Ahmadzadeh, 2011).

Environmental uncertainty conditions are the rate of changes or fluctuations in an environment that a profit unit works where s, rivals, governmental regulations, and laborer unions exist (Tung, 1979). Also environmental uncertainty can be defined as a type of inability in predicting the

probable results of a decision (Askviam). Organization theory defines environmental uncertainty as shortage of information for decision making. Accordingly, when managers do not possess information required to make future decisions, they estimate the operating environment of the profit unit as unpredictable and environmental uncertainty conditions occur (Hatch, 1997). Environmental uncertainty reflects the complicatedness and dynamicity in a firm. Within financial reporting field, Gush & Elson (2008) found out that environmental uncertainty stimulates managers to do activities to reduce information asymmetry. They suggested that managers potentially react uncertainty conditions and change their financial reporting behavior in such a situation. According to agency theory, the existence of information asymmetry among stockholders and managers is inevitable and it results from the isolation of owners from managers. Evidences show that uncertainty is potentially related to information asymmetry (Habib & et al, 2011). Thus, it seems that earning management affects information asymmetry in uncertainty conditions.

Research literature

Stockmer & Graffel (2008) remarked that uncertainty should be considered as a complex social phenomenon. Different researches have reached controversial results in some cases and a main reason of this was to ignore the channel and transfer mechanism of uncertainty.

Leuz & Schrand (2009) showed that firms react to increase in uncertainty resulting from collapse and changes in monetary markets and revise their disclosure and financial reporting policies. They suggested that reporting strategies of managers in corporations should potentially be affected by external factors such as financing resources.

Kim & et al (2010) studied the effect of capital market uncertainty on issuing earning prediction by management and the response of the investors to these predictions. They found that during high uncertainty periods, there occurs a meaningful reduction in frequency of issuing management's earning predictions on the one hand, and the spread of bad news and the size of bad news is constrained, on the other hand. The study of capital market reaction to the publishing earning predictions showed that the investors have had more severe reactions towards bad news during high uncertainty periods. These findings have shown that the investors' sensitivity to bad news on earnings during high uncertainty periods, reduces the tendency of managers to publish earning prediction especially bad news on predictions. Also the results showed that firms with high risks reduce the disclosure of discretionary information with higher probability during high uncertainty periods.

Choi (2010) showed that the fluctuation of market uncertainty causes changes in stock price reaction towards unexpected earnings of firms. Results of this research showed that when investors encounter uncertainty about the occurrence of booms or recession, bad news about earning prediction would have more severe effects on stock price reduction. This results from the fact that bad news increases uncertainty of investors regarding the future economic status change. Also, when the investors come across uncertainty during business recession times, good news will cause more severe increases in stock price.

Habib & et al (2011) studied the role of environmental uncertainty and organizational culture regarding the relationship between non-financial performance and organizational performance in manufacturing companies in Bangladesh in an experimental research. They investigated the hypothesis that non-financial activities in performance results in improving organizational performance under environmental uncertainty and organizational culture. This research was carried out on 61 manufacturing firms enlisted in Bangladesh Stock Exchange. The data were studied by using a multiple variable regression and factor analysis. A negative and meaningful relationship was observed between uncertainty conditions and financial and non-financial performances of firms. Also the results of this hypothesis showed that firms in Bangladesh have had a better non-financial performance in uncertainty conditions and firms' performance improved by reducing uncertainty. On the other hand, there has been a positive and meaningful relationship between the type of flexible organizational culture and organizational performance.

Kormir & et al (2013) studied about the relationship between earning management and information asymmetry regarding uncertainty conditions. In this study, they investigated about the relationship between earning management and information asymmetry regarding uncertainty conditions. Results showed that a complex and dynamic environment makes the relationship between discretionary accruals and information asymmetry that is taken into consideration as the fluctuations of share price and the development of measurement, weak. Specifically, it weakens the positive relationship between earning management and information asymmetry for different firms that invest a lot on R & D and those that are encountering high sales fluctuations. This issue emphasizes on the problem of investors in assessing earning management in an uncertain environment. Finally in such conditions, the discretionary accruals maybe recognized by the investors of firms enlisted in USA Stock Exchange with a transparent stock market compared to Stock Exchange in Canada.

In Iran there has not been any research carried out regarding this issue but the closest ones were as follows:

Ghaemi & Rahimpour (2009) studied quarterly earning announcements' role in reducing information asymmetry and found that information asymmetry does not decrease after quarterly earning announcements and these announcement do not contain information content to reduce information asymmetry.

Khoddamipour & Ghadiri (2010) investigated about the relationship between accruals and information asymmetry in Tehran Stock Exchange. In this research they utilized stock exchange suggested price range differences and Jones's adjusted model using an approach based on estimation error, respectively, to measure information asymmetry and items in accruals. Results of their data analysis showed that there has been a positive and meaningful relationship between abnormal accruals and information asymmetry. However, research results did not show any meaningful relationship between absolute amount of total accruals and information asymmetry.

Hejazi & et al (2011) studied the relationship between earning smoothing and information uncertainty in Tehran Stock Exchange. They used panel data regression model, fixed effects model or random effect models and panel least

squares method to test the hypotheses. The statistical population of their research involved non-financial firms enlisted in Tehran Stock Exchange during the time period between 2005 and 2009. Results showed that there has been a negative and meaningful relationship between earning smoothing and information uncertainty on business units in an assurance level of %95; the adjusted identification coefficient showed that the discretionary accruals' items, as the criteria for earning smoothing compared to the ratio of total accruals, have had more capability in describing information asymmetry in a business unit.

Bafandeh & et al (2012) studied the effect of environmental uncertainty on the selection of knowledge management strategies within product area (case study: universities and higher education institutes in Khorasan-e-Razavi). Results showed that environmental uncertainty has had a positive effect on knowledge discovery strategies and knowledge exploitation within products area. Results of this research made the role played by knowledge management strategies within product area clearer and prepared perspectives for university managers to improve their educational and research services.

Rahimian & et al (2012) investigated about the relationship between earning quality and information asymmetry in firms enlisted in Tehran Stock Exchange. They used the two patterns posed by Dechow & Dichev (2002) and Olsen's (1996) model to measure earning quality and used effective price difference criterion in first hypothesis and the percentage of price effect in second hypothesis to measure information asymmetry. The population under investigations was firms enlisted in Tehran Stock Exchange and the statistical sample included 59 firms enlisted during the time period between 2004 and 2009. Research results showed that there has been a meaningful relationship between earning quality and information asymmetry and earning quality reduction resulted in increasing information asymmetry.

Hypotheses development

Regarding what was pointed above and research questions, the hypotheses in this study could be presented in the form of two major hypotheses as follows:

Hypothesis 1: The relationship between earning management and information asymmetry is weaker in environmental uncertainty conditions.

Hypothesis 2: The relationship between earning management and information asymmetry is weaker in environmental dynamic conditions.

Methodology

The present research is correlation type regarding the method and it is applied. Additionally, due to the fact that historical information has been used in testing the hypotheses it falls within quasi-experimental researches. Also it is experimental and deduction is used for reasoning and the study type is field-library using historical information in the form of post-incident. Below we are going to explain the calculation of each of the variables:

The independent variable in this research is earning management and in order to measure it we have used discretionary accruals' quality. To calculate discretionary accruals' quality we also have used Jones's adjusted model. This model has been introduced by Dechow & et al (1995) and it has been used in different research studies (such as researches done by Dechow & Schrand, 2010; Defound,

2010). Based on Jones's adjusted model, discretionary accruals are calculated within several stages and the total accruals is calculated as follows:

Accruals = NI – CFO

Accruals: total accruals

NI: net income

CFO: operating cash flow

After calculating total accruals, the following regression pattern was adjusted.

$$\frac{\text{Accruals}_{it}}{\text{Assets}_{i,t-1}} = \alpha_1 \left(\frac{1}{\text{Assets}_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta \text{Sales}_{it}}{\text{Assets}_{i,t-1}} \right) + \alpha_3 \left(\frac{\text{PPE}_{it}}{\text{Assets}_{i,t-1}} \right) + \alpha_4 \text{ROA}_{it} + \varepsilon_{it}$$

Where,

Accruals: total accruals (the difference between net income and operating cash flow)

ΔSales: change in sales income compared to the previous period

TA: total assets at the start of the period

PPE: total book value of properties, machinery, and equipments

ROA: return on assets (net income divided by total assets)

The residuals of the regression model above showed discretionary accruals (DA). According to Defound (2010), the higher amount of discretionary accruals leads to higher earning management in firms.

Dependent variable

The dependent variable in this research is information asymmetry. Information asymmetry is a qualitative concept and in order to express it in numbers we should try to quantify it. Thus, to measure it we have used Yonkatz & Chiang (1986) model. This model has been used in several researches. Ghaemi & Watanparast (2005) and Ahmadpour & Rasaeyan (2006) used this model to measure information asymmetry. The model is as follows:

$$\text{SPREAD}_{it} = \frac{\text{AP} - \text{BP}}{(\text{AP} + \text{BP})/2} \times 100$$

Where,

SPREAD: the difference range of suggested stock exchange price

AP: average annual price suggested for firm's stock sales

BP: average annual price suggested for firm's stock purchase

Adjusting variables

Environmental uncertainty conditions: supposing that accounting in firms with varied geographical operations and business is more complex, complex environmental conditions reflect the multiple section characteristic of a firm and the geographical distribution of the firm intended should be taken into consideration in order to estimate complex environmental conditions. Therefore, firms that

have complexity possess different branches and dependent firms throughout the country. Thus, to calculate uncertainty conditions we use pooled financial statement index (Denis & et al, 2013). In this way, if the firm has presented pooled financial statements the number attributed would be 1, or else, it would be 0.

Dynamic environmental conditions: to measure this variable we use sales variation coefficient. If the coefficient of sales dispersion is higher than the mean, the amount would be 0, or else, it would be equal to 1. This variable is calculated by using the following equation:

$$\text{SCV}(Z_i) = \frac{\sqrt{\frac{(Z_i - \bar{Z}_i)^2}{5 - 1}}}{\bar{Z}}$$

Where,

CV: sales variation coefficient

Z: firm's sales amount

\bar{Z} : the average of 5 years of sales

Control variables

Since the independent variable is not completely able to predict the dependent variable, the inclusion of control variables in the model results in reducing prediction error.

Firm size: there are different criteria to measure firm size such as: total assets, sales amount, n number of stocks, total number of staffs. In this research we have used n value of assets in Rials (Ahmadzadeh, 2011).

Systematic risk of stocks: there are different methods to measure systematic risk. In this research we have used beta coefficient to measure it. This shows market return correlation and stock return and it is calculated through dividing firm stock return covariance and market return divided by market return variance as follows:

$$\beta_i = \frac{\text{cov}(r_i, r_m)}{\text{var } r_m}$$

The duality of CEO's duty: to measure this variable we consider the existence of lack of existence of a certain condition regarding CEO. Accordingly, duality of CEO's duty is a two states variables and if CEO is the managing director either, it would equal 1 and if not it would be 0.

The percentage of independent directors: the ratio of independent managers is calculated by dividing the number of independent members in board into total board members.

INDDIR =

Board size: to calculate it we use the number of board members.

Data analysis

The table below shows the results of the descriptive statistics of 600 year-firm among research variables:

Table (1): Results of the descriptive statistics of quantitative variables

Variable	Symbol	Mean	Median	Maximum	Minimum	Std. Dev	Skewness
Information asymmetry	SPREAD	0.016	0.016	0.040	0.000	0.008	0.236
earning Management	EM	03.333	0.0007	1.040	-0.558	0.129	0.900
Systemic risk	SYSRISK	0.517	0.429	2.842	-1.834	0.686	0.520
Percent of Non-bound managers in board	INDDIR	0.621	0.600	1.000	0.000	0.253	-0.904
Board Size	BODSIZE	4.975	5.00	7.000	2.000	0.417	-0.712
Corporate Size	SIZE	13.044	12.948	18.524	9.454	1.504	0.908
conditions and Mutual Effect of complex environmental earning Management	EM_SEGMENTS	0.005	0.000	0.348	-0.558	0.069	-0.262
Mutual Effect of dynamic environmental conditions and earning Management	EM_SCV	0.0003	0.000	0.557	-0.384	0.088	0.433

Table (2): Results of the descriptive statistics of qualitative variables

Variable	Absence number	Existence number	Absence Percent	Existence Percent
Information asymmetry in complex environments and no complex environment	399	201	66.5	33.5
Information asymmetry in dynamic environments and no dynamic environment	305	295	50.8	49.2
Information asymmetry in Managing duties duality and no Managing duties duality	505	95	84.2	15.58

Regarding the descriptive statistics, we can divide the indexes above into central tendency indexes, variation indexes, and other indexes. The central tendency indexes are

mean, median, and mode. The variation indexes include standard deviation criterion. And other indexes are minimum, maximum, skewness, and pulling. Results of normality test were as follows:

Table (3): Results of normality test

Variable	K	Asymp (sig)
Information asymmetry	0.910	0.378
earning Management	1.350	0.102
Systemic risk	1.534	0.051
Percent of Non-bound managers in board	5.427	0.000
Board Size	11.076	0.000
Corporate Size	1.494	0.071

Results of Kolomogorov-Smirnov test showed that the distribution of the variables of information asymmetry, earning management, systematic risk, and firm size was not normal. Thus, regarding that the dependent variable in this research has had a normal distribution, we have used parametric statistical methods. Also due to the fact that the meaningfulness level of the variables of the percentage of

independent managers in board and board size was below 0.05, these variables were not normal.

In this research we have used adjusted DickiFuler test (ADF) to test the consistency. Results of this test are presented in table 4 below:

Table (4): Results of unique root test, DickiFuler test

Variable	t	Sig.
Information asymmetry	-14.769	0.000
earning Management	-21.435	0.000
Systemic risk	-18.301	0.000
Percent of Non-bound managers in board	-11.460	0.000
Board Size	-17.735	0.000
Corporate Size	-9.229	0.000

Regarding the results in table above, all research variables have had consistency in assurance level of %95. Below the

results of testing the hypotheses have been presented in the table:

Table (5): Results of testing hypotheses

Variable	complex environmental conditions		dynamic environmental conditions	
	Coefficient	Sig.	Coefficient	Sig.
C	0.002	0.503	0.002	0.526
Systemic risk	0.003	0.000	0.003	0.000
Percent of Non-bound managers in board	-0.002	0.016	-0.002	0.019
Managing duties duality	0.0007	0.325	0.0007	0.335
Board Size	-0.0005	0.445	-0.0005	0.436
earnings management	0.005	0.036	0.002	0.040
The relationship between earnings management and information asymmetry	0.001	0.804	0.005	0.164
Corporate Size	0.001	0.000	0.001	0.000
R-squared	0.348		0.350	
Adjusted R-squared	0.334		0.337	
Durbin-Watson stat	1.542		1.633	
F	26.135	Prob.0.000	26.407	Prob. 0.000
Godfrey	4.518	Prob.0.098	5.414	Prob. 0.075
F-white	1.166	Prob.0.223	1.187	Prob. 0.199
H-hausman	120.154	Prob.0.000	138.652	Prob.0.000
F-limer	32.007	Prob.0.000	31.889	Prob. 0.000

Regarding the results of research hypotheses presented in table (5), the meaningfulness level of F-Limer statistic (0.000) has been less than acceptable error level (%5). Thus, panel data method has had a priority over pooled data method and to adjust the regression model we used panel data method. Also regarding that the meaningfulness level of Hausmann statistic (0.000) has been less than acceptable error level (%5), the regression with fixed effects has had a priority over regression with random effects. Also due to the fact that the meaningfulness level of F-White statistic has been higher than %5, the regression did not have variance divergence. Finally due to the fact that the meaningfulness level of Godfrey statistic has been higher than %5, the regression did not have self-correlation problem. Next, regarding that F statistic (0.000) has had a meaningfulness level of below %5, the regression could not identify. But since the meaningfulness level of the index of environmental uncertainty conditions on the relationship between earning management and information asymmetry (independent variable) has been higher than %5, it can be stated that environmental uncertainty conditions did not have a meaningful effect on the relationship between earning management and information asymmetry. The amount of identification coefficient showed that changes in independent and control variables could explain %34.8 of changes in the dependent variable. Also in the second hypothesis, the dynamic environmental conditions did not have a meaningful effect on the relationship between earning management and information asymmetry. But the percentage of independent managers in board had a negative effect and systematic risk, earning management, and firm size had a positive and meaningful effect on information asymmetry. The amount of identification coefficient showed that changes in independent and control variables could represent %35 changes in the dependent variable. Finally, Durbin-Watson statistic has been between 1.5 and 2.5. thus,

we can conclude that there has not been self-correlation problem among the variables. Regarding the positive relationship between earning management and information asymmetry we can say that this result accords with research results of Krimer & et al (2013) and regarding the relationship between earning management and information asymmetry in environmental and dynamic uncertainty conditions we can say that this result was not the same as found in a research by Denis & et al (2013).

Discussion and conclusion

Research findings showed that on the whole in a complex and dynamic environmental condition, there has not been a meaningful relationship between earning management and information asymmetry. Regarding the first research hypothesis we can say that since the presentation of pooled financial statements (complex environmental index) is commonly seen in big companies, they emphasize more on information asymmetry and earning management because these factors can present lots of information to the market after the manager exits the firm and this results in stock price reduction. Accordingly, the presentation of pooled financial statements in these firms that is a factor in complex environmental conditions, can not be considered as an effective factor in the relationship between earning management and information asymmetry. Also regarding the rejection of the second hypothesis, the effect of sales changes coefficient (dynamic environment index), on the relationship between earning management and information asymmetry we can say that these variables are controlled by the owners of economic unit and it is highly important for the owners. Therefore, the owners avoid sales changes coefficient because it increases operating risk of economic unit and finally the fluctuations of operating cash flows increase. But regarding the approval of the positive relationship between earning management and information asymmetry, on the whole we can say that when a manager uses any earning management pattern the result is that the

investors incur a considerable cost to process information to achieve a complete understanding of the meanings of financial information in issues such as accruals' value. The investors that try to understand the real economic value of accruals increase the difference range of the suggested prices. Therefore, it is expected that by increasing the amount of discretionary accruals (an index of earning management), the difference range of the stock exchange price suggested (an index of information asymmetry) will increase either.

Regarding the results of this research it can be suggested to the investors to consider variables such as information asymmetry and earning management when analyzing to purchase firms' stocks. Regarding the fact that the goal of managers is to absorb the trust of firm owners, they should pay attention to the fact that increasing information asymmetry and earning management will lead to the exit of investors from the market. Finally it results in increasing agency costs. It can be suggested to Stock Exchange organization to devise rules and regulations that create a strong control structure in firms due to the importance of information asymmetry and earning management.

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