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EFFECTS OF EARNINGS MANAGEMENT AND DISCLOSURE OF INFORMATION ON INFORMATION ASYMMETRY BETWEEN THE FIRMS LISTED ON THE TEHRAN STOCK EXCHANGE

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Abstract

In order to achieve stable and continuous profit, management tries to eliminate the periodic fluctuations of profit and provide a profit planning with a constant growth rate. This leads that the firm's vision seems desirable and its performance is assessed acceptable. Managers disclose the information in order to make the investors aware of the firm's future visions, goals and strategies. Providing financial and non-financial information about the company reduces the information asymmetry, increases the stock liquidity and thus improves the financial situation of the company. Therefore, in this study, the effects of earnings management and disclosure of information on information asymmetry between the firms listed on the Tehran Stock Exchange was investigated. The results of investigating 100 firms in the period from 2009 to 2014 showed that there is a relationship between earnings management and information asymmetry and also there is a relationship between the disclosure of information and information asymmetry.

Key words: earnings management, information asymmetry, disclosure of information.

Introduction

Information asymmetry between management and external parties such as investors, one of the most prominent issues in various areas, including the capital market. Information asymmetry simply indicates that all people don't have the access to the information equally and the management has access to more information than others according to its position. Information asymmetry is a major factor in guiding managers towards earnings management (Ambrose, 2009).

Earnings management occurs when the manager uses his personal judgment for financial reporting and do this with the aim of misleading some shareholders about the actual economic performance or affecting the results of contracts

which depend on reported accounting figures (Thomas, 2002). Some investors including individuals who work in the organization, such as managers, analysts and the institutions that receive information from these individuals, have access to confidential news (Easley, 2004).

If the confidential information is more, the difference between the bids for the purchase and sale of shares increases between investors and as a result, the returns of the investors who do not have access to such information, are reduced (Lafond, 2008).

One of the effective factors in decision-making is the right information related to the decision. If the information is asymmetrically distributed between the individuals, different results may be obtained on one subject. When the information asymmetry about a company's stock increases, its intrinsic value will differ from the value that the investors ascribe to the intended stock in the capital market. As a result, the real value of the company's stock value will differ from the value expected by the shareholders (Ghaemi, 2005).

Problem statement

Market participants are always looking for high quality financial information, because this information reduces the information asymmetry between company management and external investors. Usually, when new information concerning the companies' status is released on the market, this information is analyzed by analysts, investors and other individuals and based on that, they decide to buy and sell. This information and its impact on the behavior of consumers, particularly shareholders, change the price and volume of stock trading, because how to deal with this new information forms the price fluctuations. Therefore, in the case of information leakage, different reactions can be observed from investors due to the existence of information asymmetry in capital market that this will cause incorrect and misleading analysis of the current state of the market. One of the information that should be available for capital market participants is the earnings declarations of the firms which can be divided into two groups of predicted annual earnings and quarterly earnings of the company. Undoubtedly, these declarations contain important news that would be effective in the decisions of the investors. Thus, access to them in any way before their public announcement, will show reactions in the capital market which, in turn, will lead the information asymmetry. Lack of equal access to information in the capital market due to the information asymmetry will cause undesirable social consequences, such as the high cost of transactions, the market with poor performance, low liquidity and overall, the reduced profits of transactions. So, investigating the relationship between earnings management and the information asymmetry in the market and the information content of the disclosure of information on earnings is of great importance. The main

research question is whether earnings management and disclosure of information affect the information asymmetry between the firms listed on the Tehran Stock Exchange.

Research background

So far, many studies have been done on the earnings management but less attention has been paid to its impact on the information asymmetry.

Ahmadpour (2014) has investigated the relationship between information asymmetry and real earnings management of the firms listed on Tehran Stock Exchange. The results showed that there is a direct relationship between information asymmetry and abnormal cash flow and abnormal cost of production, but, no significant relationship was observed between the information asymmetry and abnormal discretionary expenditures. Babajani (2014) has examined the relationship between the information asymmetry and earnings management. The results showed that the index of information asymmetry, which is a combination of five chosen measures, has positive and significant impact on the earnings management. Khoddamipour (2013) has performed the research entitled “the effect of the quality of disclosure of information on different types of earnings management”. The results showed that there is a negative and significant relationship between the quality of disclosure and earnings management of accruals and real earnings management. Also, they represented the significant negative relationship between the overall earnings management and the quality of disclosure. Nikbakht (2012) has conducted the research entitled “the impact of conditional conservatism on the reliability of the information and the timeliness of disclosure”. The results showed that applying conditional conservatism reduces the reliability of information disclosed by the firms and increases the fluctuations in predictions and also, increases the difference between them and real values. Mehrani et al. (2011) have investigated the unexpected accruals and conservatism in stock companies and showed that there is a positive and significant relationship between discretionary accruals of Jones model and conservatism. Given the results of these two studies, it can be expected that applying conservatism with increasing the levels of discretionary accruals will cause the reduction in the quality of disclosure. Zhang (2015) has studied the effects of the information asymmetry between managers and shareholders in relation to profitability in terms of time and amount. According to the results, whatever the level of institutional ownership increases, there will be lower information asymmetry between company’s executives and other related parties in the market. Therefore, in the companies where the inter-corporate ownership is more, the price of stock market includes the data related to the company's future profitability more quickly than the companies where the inter-corporate ownership is less in. Chung et al. (2013) have studied on the impact of

disclosure on the information asymmetry and found that the quality of disclosure, as an efficient program, can affect how to communicate with investors; this means that it can affect the disclosure position of company, how the company is paid attention by the analysts and also lead the attraction of institutional investors, improve the public perception, reduce the capital expenditure and finally increase the standards of disclosure. According to Francis (2005), extensive disclosure policy is a mechanism that reduces the information asymmetry between managers and external investors. Glosten and Milgrom (1985) had modeled the relationship between corporate disclosure and the information asymmetry. Their model showed that the information asymmetry decreases in proportion to the level of corporate disclosure. Welker (1995) provided the empirical evidence in accordance with this result. His findings showed that the information asymmetry and market liquidity decreases and increases in proportion to the increased level of disclosure, respectively.

Research hypotheses

- There is a significant relationship between earnings management and the information asymmetry.
- There is a significant relationship between the disclosure of information and the information asymmetry.

Method

In terms of methodology, this study is an applied research that the relationship between the disclosure of information, symmetry of information and earnings management was described using cross sectional correlational research method. Also according to the general plan of data collection that the historical data was used, this is considered as Ex-Post Facto research.

Dependent variable: information asymmetry

To calculate the information asymmetry in Tehran Stock Exchange, following model was used. This model was firstly used to determine the bid for the purchase and sale of stock (bid-ask spread range) in 1986 by Chiang and Vankatsh. After them, other people used the model in their research. The model is as follows:

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

Where:

T: studied period

I: studied firm

SPREAD: bid-ask spread range

AP (ASK PRICE): the ask price for firm i in the period t

BP (BID PRICE):the bid price for firm i in the period t.

For the calculation, the best bid and ask prices for each share are extracted for 21 days before and after announcing the estimated earnings and after calculating “the difference range between the bid and ask prices”, the mean value of each sample is calculated before and after announcement, if the mean difference range between the bid and ask prices is zero, it will represent the information symmetry and otherwise, it will indicate the information asymmetry.

Independent variable: quality of corporate disclosure

Quality of corporate disclosure is one of the endogenous variables of this research. In this study, the calculated annual scores of the quality of corporate disclosure for the firms listed in Tehran Stock Exchange during the years 2009-2014 were used. The scores of the disclosure of listed firms were calculated for periods of 3, 6, 9 and 12 months and they have been published for the years of 2003 onwards by the Stock Exchange organization. These scores reflect the assessment of stock on the knowledge of corporate disclosure. The scores were calculated based on weighted average of the criteria of timeliness and reliability of the disclosed information. The evaluated information is according to the regulations of information disclosure in exchange, including annual financial statements, 3-, 6- (audited) and 9-month mid-term financial statement and predicted earnings of each share in 3-, 6-, 9- and 12-month periods. A delay in sending information to the stock exchange compared to determined time frames and differences between the reached and predicted earnings were used to calculate the timeliness and reliability of disclosure. To calculate the total rank of corporate disclosure, the criteria of timeliness and reliability were used by two-third and one-third weights, respectively.

Independent variable: earnings management

Schipper defined the earnings management as “deliberate interference in the external reporting process with the aim of gaining some personal benefits by the managers or shareholders” (Moradzader et al., 2009).

Measurement of Earnings Management

Discretionary accruals are another endogenous variables of this research. In this study, according to the existing literature, discretionary accruals is used as an alternative to earnings management. To calculate discretionary accruals, firstly, the total accruals of the company in the studied year must be calculated. In this study, to calculate the total accruals, two balance sheet and cash flow methods were used. After calculating the total accruals, involuntary accruals must be calculated and finally, discretionary accruals are obtained by deducting involuntary accruals from total accruals. In the traditional balance sheet method, total accruals are calculated as follows:

$$TACC_{i,t} = \Delta CA_{i,t} - \Delta CL_{i,t} - \Delta Cash_{i,t} + \Delta STDEBT_{i,t} - DEPTN_{i,t}$$

TACC_{i,t}: Total accruals of company i at the end of the year t

ΔCA_{i,t}: Changes in current assets during the period t

ΔCL_{i,t}: Changes in current liabilities during the period t

ΔCash_{i,t}: Changes in cash flows during the period t

ΔSTDEBT_{i,t}: Changes in current portion of long-term debt and other short-term liabilities classified in current liabilities during the period t

DEPTN_{i,t}: depreciation of fixed assets and intangible assets in the period t

In the cash flow method, total accruals are calculated as follows:

$$TACC_{i,t} = EBXT_{i,t} - OCF_{i,t} \tag{2}$$

EBXT_{i,t}: Profit before extraordinary items and non-recurring operations in the period t

OCF_{i,t}: operational cash flow in the period t which is obtained based on the following equation.

OCF: operating cash flow according to cash flow + paid dividends paid + cash flow related to the returns of investment and paid dividends for financing - Cash flow related to taxes. “These adjustment was done because of the difference between Iran accounting standards No.2 and American standards FASB 95”.

Discretionary accruals are equal to the difference between total accruals and involuntary accruals. In order to estimate the involuntary accruals, firstly, the modified Jones model is estimated as follows:

$$TACC_{i,t} = \alpha_0(1/A_{i,t}) + \alpha_1 \Delta REV_{i,t} + \alpha_2 \Delta REC_{i,t} + \alpha_3 \Delta PPE_{i,t} + \varepsilon_{i,t}$$

TACC_{i,t}: Total accruals of the company i at the end of the year t divided by total assets of the company at the end of the year t-1.

A_{i,t}: Total assets of the company i at the end of the year t-1.

ΔREV_{i,t}: change in the revenue of the company i during the year t divided by total assets of the company at the end of the year t-1.

ΔREC_{i,t}: Changes in net earnings of the company i at the end of the year t divided by the total assets of the company at the end of the year t-1.

The above equation was estimated for each industry using Ordinary Least Squares (OLS) method. Then the parameters of α₁ , α₁ and α₁ obtained from the regressions are used to estimate the involuntary accruals as follows:

$$NDACC_{i,t} = \hat{\alpha}_0(1/A_{i,t-1}) + \hat{\alpha}_1 \Delta REV_{i,t} + \hat{\alpha}_2 \Delta REC_{i,t} + \hat{\alpha}_3 PPE_{i,t}$$

$NDACC_{i,t}$ involuntary accruals of the company I at the end of the year t, which is divided by the total assets of the company at the end of the year t-1.

Finally, discretionary accruals are calculated as follows:

$$DACC_{i,t} = TACC_{i,t} - NDACC_{i,t}$$

Hypothesis testing model

It is not clear whether decisions of management on disclosure arise from his desire to have more flexibility for earnings management or the ability of manager to manage earnings is due to his authority in adopting the policy of disclosure. Both of these cause and effect relationships are justified. Therefore, it can be said that the decisions related to earnings management and disclosure of information by companies are determined simultaneously and endogenously. In this study, to calculate this potential Simultaneousness, the relationship between the quality of corporate disclosure and earnings management using simultaneous equations (Eq. 6 and 7) including variables such as disclosure score (an alternative to disclosure quality), discretionary accruals (an alternative to earnings management) and some control variables such as firm size, leverage of the company, company's adjusted return, company's current performance and company's future performance, was used.

$$DACC_{i,t} = \alpha_0 + \alpha_1 DS_{i,t} + \alpha_2 CRP_{i,t} + \alpha_3 FRP_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 SIZE_{i,t} + \varepsilon_{i,t}$$

$$DS_{i,t} = \beta_0 + \beta_1 DACC_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 VWRET_{i,t} + \varepsilon_{i,t}$$

$DS_{i,t}$: disclosure of company i in year t

$CRP_{i,t}$: the performance of the company in the current period (to industry) based on the net profit of the company i in the year t, divided by total assets at the end of the year t-1.

$FRP_{i,t}$: the performance of the company in the future period (to industry) based on the net profit of the company i in the year t+1, divided by total assets at the end of the year t-2. (Also, this variable is a function of variable CRP).

$LEV_{i,t}$: Total debts of the company I divided by total assets at the end of the year now i t (which is the company's financial leverage).

$SIZE_{i,t}$: market value of the company i at the beginning of the year t.

$VWRET_{i,t}$: adjusted return of the company I in the year t which is equal to the share returns minus total market returns. In equation (6), discretionary accruals is a function of disclosure score and four exogenous variables that previous research showed that there are relationships between them and discretionary accruals. According to equation

(7), disclosure score is a function of discretionary accruals and two exogenous variables including firm size and adjusted returns of the company which were identified in previous studies.

Research population and sample: The population of this study included all manufacturing companies listed on the Tehran Stock Exchange during the period 2009-2014. The samples were selected using systematic sampling method and applying following conditions. Accordingly, the research sample included 255 firm-year related to 51 firms:

1. The company' fiscal year ended to 19th March.
2. The company didn't change the fiscal year in the studied period.
3. Annual score of the company's disclosure quality and its financial information are available.
4. The company's shares have been traded during the studies period.
5. Since, in this study, the modified Jones model is fitted for any industry, studied industry should have high frequency of eligible data (at least 30 firm-year data). In order to reduce the impact of unusual values, the companies that their absolute value of discretionary accruals is more than 200% of total assets were not included in the sample. According to above conditions, 100 companies in the period 2009 to 2014 had above conditions that due to limited conditions, all of them were selected as sample.

Analysis of findings

Correlation coefficient test

To determine the relationship between variables, Pearson correlation coefficient was used. Studying the correlation is a statistical tool that can be used to measure the degree which a variable is related to another one linearly.

Table-1. Pearson's correlation coefficients between variables.

Variable	Disclosure score	Adjusted return	Quality of information	Firm size	Performance of future period	Performance of current period
Disclosure score	1					
Adjusted return	0.153 0.50	1				
Quality of information	0.422 0.000	0.117 0.137	1			
Firm size	0.276 0.000	0.371 0.000	0.903 0.000	1		

Performance of future period	0.716 0.000	0.028 0.718	0.808 0.000	0.581 0.000	1	
Performance of current period	0.534 0.000	-0.271 0.000	0.564 0.000	0.210 0.007	0.867 0.000	1

Unit root test

Before analysis and hypothesis testing, the reliability of research variables must be investigated. The reliability of variables means that the average and variance of the research variables has been stable between years. So, the use of these variables in the model doesn't create false regression. Unit root test was performed using the test provided by Levin, Lin and Chu (2002), Fisher unit root test, Fisher – Augmented Dickey-Fuller Unit Root Test (Fisher-ADF) and Fisher Philips Peru unit root test (2001). The results of stationary test showed that the Prob of all variables was less than 5% and the research variables were stable; therefore, the null hypothesis (variables have unit root) is rejected.

Table-2. Unit root test for variables.

Variables	Levin, Lin and Chu		Fisher – Augmented Dickey-Fuller Unit Root Test		Fisher, Philips/ Peru	
	Statistic	p.v	Statistic	p.v	Statistic	p.v
Adjusted return	-5.4	0.000	162.5	0.000	199.16	0.000
Adjusted return	-7.15	0.000	187.6	0.000	204.5	0.000
Quality of information	-9.5	0.000	93.9	0.03	102.9	0.04
Firm size	-27.4	0.000	94.77	0.000	102.2	0.000
Performance of future period	-9.6	0.000	112.7	0.000	119.6	0.000
Performance of current period	-6.8	0.000	98.5	0.000	105.5	0.000

Source: Author

F-Limer test or Chow (investigating the similarity of the intercepts of sections)

To choose between using panel data and pool data, F-Limer test (Chow) was used. In F-Limer test, the null hypothesis (H0: similarity of the intercepts) (pool data) is placed against the opposite hypothesis (H1: dissimilarity of intercepts) (panel data). According to table3, null hypothesis was confirmed, so, pool data was used (p.v was greater than 5%). Summary results of F-Limer test were listed in table3.

Table-3. Results of F-Limer test (similarity of the intercepts).

Chow test	Research models	F-statistic	p-value	df	Result	Type of test
The intercepts of sections are identical	Research model	1.26	0.23	5.58	H0 is not rejected.	Pooled data

Table result of the significance test of the research model are shown in Table4 as combined analysis of data. This test was done to examine the impact of earnings management and information disclosure on the information asymmetry.

Table-4. Results of research model test at the level of combined data.

Description	Coefficient	t-statistic	Error level	Adjuster R ²	F-Fisher p.v	Durbin Watson
C	7.21	6.8	0.000	0.619	5.6 0.000	1.78
DACC	-0.02	-2.17	0.03			
VWRET	0.06	3.39	0.00			
LEVE	0.06	3.30	0.001			
SIZE	-0.04	-1.8	0.06			
FRP	0.05	2.07	0.04			
CRP	-0.03	-1.9	0.06			

Source: Author

As can be seen in Table4, F-statistic is significant at the confidence level of 99%. So, in general, the research model is significant and dependent variable can explain the independent and control variables. Additionally, adjuster R² was estimated 0.61. This shows that about 61% of the changes in dependent variable, i.e. information asymmetry, were

due to independent and control variables and 39% of them were due to other factors. Also, the Durbin-Watson statistic values substantially corroborate the notion that there is no correlation between the distributing elements of the model because these values are in the range of 1.5-2.5. Given the results of research model test, the coefficients of the research model are as following equation:

$$DS_{i,t} = 7.21 - 0.03CRP_{i,t} + 0.05FRP_{i,t} + 0.06LEV_{i,t} - 0.04SIZE_{i,t} + 0.06VWRET_{i,t} + \epsilon_{i,t}$$

The results of hypothesis testing are explained as follows:

First hypothesis testing

First hypothesis: there is a relationship between earnings management and information asymmetry.

H0: there is no relationship between earnings management and information asymmetry.

H1: there is a relationship between earnings management and information asymmetry.

In this hypothesis, the dependent variable is information asymmetry and independent variable is earnings management. Given the results shown in table 5, the correlation between information asymmetry and earnings management was 2.17. Correlation coefficient is a variability in the dependent variable which can be explained by the regression. To determine the significance of the coefficients, t-student statistic is used. The results of hypothesis test and t-statistic related to first hypothesis are shown in table5. P-value statistic for the variable of earnings management is 0.03. Given that the error level considered in this study is 5%, there is a relationship between the variables of earnings management and information asymmetry and first hypothesis is confirmed at the confidence level of 95%.

Table-5. The results of the significance test of coefficients related to first hypothesis.

Period	2006-2011
t-statistic	2.17
Error level	0.03
Coefficient	-0.02
Number of observations	600
Result	Confirmed
Type of relationship	Direct

Source: Author

The coefficient of first independent variable, i.e. earnings management, is positive. Therefore, the relationship between it and information asymmetry was positive and direct (linear) and information asymmetry decreases by the reduction in earnings management.

Second hypothesis testing

Second hypothesis: there is a relationship between information disclosure and information asymmetry.

H0: there is no relationship between information disclosure and information asymmetry.

H1: there is a relationship between information disclosure and information asymmetry.

In this hypothesis, the dependent variable is information asymmetry and independent variable is information disclosure. Given the results shown in table 6, the correlation between information asymmetry and earnings management was -3.39. Correlation coefficient is a variability in the dependent variable which can be explained by the regression. The results of hypothesis test and t-statistic related to second hypothesis are shown in table6. P-value statistic for the variable of information disclosure is 0.000. Given that the error level considered in this study is 5%, there is a relationship between the variables of information disclosure and information asymmetry and second hypothesis is confirmed at the confidence level of 95%.

Table-6. The results of the significance test of coefficients related to second hypothesis.

Period	2006-2011
t-statistic	-3.39
Error level	0.000
Coefficient	0.06
Number of observations	600
Result	Confirmed
Type of relationship	Inverse

Source: Author

The coefficient of the variable information disclosure is negative. Therefore, the relationship between it and information asymmetry was inverse and direct (linear) and information asymmetry decreases by the increase in information disclosure.

Conclusion

In order to test the hypotheses, regression analysis was used for the years 2009 to 2014. The statistical results of the model estimation were obtained according to model test and F-statistic. In general, research model is significant.

Table-7. Research hypotheses and models.

Research model	$DS_{i,t} = 7.21 - 0.03CRP_{i,t} + 0.05FRP_{i,t} + 0.06LEV_{i,t} - 0.04SIZE_{i,t} + 0.06VWRET_{i,t} + \epsilon_{i,t}$	
First	There is a relationship between earnings management and	confirmed

hypothesis	information asymmetry.	
Second hypothesis	There is a relationship between information disclosure and information asymmetry.	confirmed

Source: Author

In this part, the results of hypothesis testing are provided separately.

The results of first hypothesis testing

In first hypothesis, the relationship between earnings management and information asymmetry was examined. According to the results of regression analysis, the results showed that there is a positive and significant relationship between earnings management and information asymmetry and first hypothesis was confirmed. In other words, the information asymmetry decreases in the companies by the reduction in earnings management. The coefficient of first independent variable, i.e. earnings management, is positive. Therefore, the relationship between it and information asymmetry was positive and direct (linear) and information asymmetry decreases by the reduction in earnings management. The results of this study are consistent with the results of the studies by Ahmadpour (2014) and Babajani (2014). They have concluded that there are direct relationships between information asymmetry and unusual cash flow and abnormal production cost but there is no relationship between it and abnormal discretionary expenditures.

The results of second hypothesis testing

In second hypothesis, the relationship between information disclosure and information asymmetry was examined. According to the results of regression analysis, the results showed that there is a negative and significant relationship between information disclosure and information asymmetry and second hypothesis was confirmed. In other words, the information asymmetry decreases in the companies by the increase in information disclosure. The coefficient of the variable of information disclosure is negative. Therefore, the relationship between it and information asymmetry was negative and direct (linear) and information asymmetry decreases by the increase in information asymmetry.

The results of this study are consistent with the results of the study by Glosten, and Milgrom(1985). They have argued that those companies apply the policy of informative disclosure, have more follower analysts, more correctly predicted earnings, less dispersion in analysts' predictions and fewer fluctuations in corrected predictions. If less dispersion in analysts' predictions is a valid measure of information asymmetry, the results show that the informative disclosure policy reduces information asymmetry. In line with this research, by studying the information sources related to the research topic and given the obtained results, following recommendations are provided:

- It is recommended to use corporate governance tools. They reduce information asymmetry. Reducing information asymmetry gives better performance of the capital market and as its result, financial market is provided which is the necessary for economic development.
- The drafters of auditing standards use required mechanisms in the development of standards to apply the more influence of auditors on the quality of disclosure.

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