

EFFECT OF MANAGEMENT EARNINGS FORECAST ON INFORMATION ASYMMETRY

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Abstract

In present research effect of management earnings on information asymmetry is addressed in Tehran Securities Exchange. In order to calculate information asymmetry, bid-ask spread during period of 21 days before to 21 days after actual earnings announcement and forecast earnings announcement was used as information asymmetry measure. The studied sample consisted of 300 cases of earnings announcements related to 60 firms listed in Tehran Securities Exchange during 2006-2010. Findings from present research show that during the study period information asymmetry decreased after actual earnings announcement and forecast earnings announcement and on the other hand there was a significant relationship between information asymmetry and earnings forecast error.

Keywords: information asymmetry, bid-ask spread, adverse selection, earnings announcements

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Introduction

Information symmetry exists when managers and market have the same information about the firm. But in the case of information asymmetry managers have more and better information on the firm because of having private and confidential information about it, i.e. they have access to corporate information before market can access it. Specific information about the firm spreads into market through information disclosure over time. If accounting earnings announcement and other information are provided in a correct way, information asymmetry is reduced to a great level. But if this job is not done in a correct way, negative effects of it can be observed in transaction volume, abnormal return, bid-ask spread, etc. Low informed investors may not be able to process the information as correct as experienced ones. As a result, if announced earnings are not of suitable quality, this can be increase information asymmetry among financial market investors. In order to sell their shares, investors refer to stock brokers and declare their bid-ask prices. These prices may fluctuate frequently during the day because each investor declares his\her own favorable prices to stock brokers. Transaction occurs when seller and buyer agree on an equilibrium price[1].

Purpose for these disclosures is to reduce the gap between investor expectations, reduce information advantage of some investors and in turn decrease the effect of information asymmetry on corporate capital cost. This argument is based on the insight that information asymmetry incurs in transactional costs because of adverse selection [8].

Adverse selection is a state in which an individual or group has an informational advantage over other individuals or groups in the market [3]. When market makers become aware of presence of uninformed individuals in market, adverse selection problem is worsened. In this case, market makers exploit increased prices to compensate for adverse selection risk and this in turn leads to increased stock bid-ask spread which reflects increased level of information asymmetry. When information asymmetry increases for stock of a certain firm, intrinsic value of that stock differ from the value investors consider for it in stock market. Thus real value of firm stock will be different from the value expected by investors [5].

Association of Studies of the Effects of Earnings Announcement on Information Asymmetry is associated with USA, France and Japan. These countries have similar rules and regulations on securities. In contrast Iran is different from these countries in this respect and earnings

announcements in Iranian context are in the form of imperative disclosures. So identifying the effect of earnings announcement on information asymmetry seems to be necessary in Iran.

One of the reasons for conducting the present study on the effect of management earnings forecast on information asymmetry is to see if announcement of earnings forecast by management contains useful information for investors in their decision making process and if it is able to reduce information asymmetry in capital market so that investors can invest their assets with more confidence?

Literature

Several empirical studies were confirmed the idea that managers release forecasts in order to adjust investors' expectations based on their own ones. King et.al, (1990) developed the hypothesis that managers use voluntary disclosures to adjust investors' expectations in order to reduce transactional costs due to information asymmetry in securities markets. Many empirical studies investigated the effect of management forecasts on information asymmetry in markets. Coller and Yohn (1997) reported that bid-ask spread increased around announcement of management forecast and after announcement, it decreased to a level lower than before announcement. Lee et.al, (1993), Krinsky and Lee (1996) and Affleck-Graves et.al, (2000) found an increase in bid-ask spreads within three days around earnings announcement. Krinsky and Lee (1996), reported that increase in bid-ask spread around earnings announcement to a large extent is due to information asymmetry measured by adverse selection. Affleck-Graves et.al, (2000), reported that increase in bid-ask spread around earnings announcement had an inverse relationship with ability to forecast earnings. Libby et.al, (2002) reported that bid-ask spread before earnings announcement was wider and had less depth [9].

Findings of Diamond and Verrecchia (1991), showed that how public disclosures can decrease information asymmetry. They pointed to presence of informed traders having more information about securities market performance and stated that before public disclosures, uninformed traders set bid-ask spread with most information asymmetry in order to compensate for potential loss in transaction with informed traders. After a public disclosure which releases internal information, traders reduce this bid-ask spread because disclosure removes superiority of informed investors in firm valuation. So disclosure reduces information asymmetry as measured by bid-ask spread [5]. Kim and Verrecchia (1994) state that public disclosure can lead to information asymmetry

because some traders process disclosed items as confidential information on corporate performance. Thus earnings announcement induces informed judgment which in turn leads to information asymmetry among traders [9].

Morse and Ushman (1983) and Chiang (1986) pointed to information asymmetry in the period after earnings announcement in their studies on New York Exchange.

Coller and Yohn (1997) investigated on bid-ask spread trend around earnings announcement. They argued that firms which released earnings forecasts, had increased level of information asymmetry before releasing forecasts than firms which did not release any forecast and stated that information asymmetry associated with forecasting firms increased on the forecast release day and the day after it [9].

Glosten and Milgrom (1985) showed that bid-ask spread was due to increase in number of informed investors relative to uninformed ones [6].

Lekhal (2008) studied the effect of seasonal earnings announcement on share price reaction and transaction volume and relative effect of bid-ask spread as an indicator of information asymmetry and market liquidity. Results showed that after seasonal earnings announcement information asymmetry decreased [7].

Qaemi and VatanParast (1995), studied the role of accounting information in information asymmetry in Tehran Securities Exchange. They used bid-ask spread to define information asymmetry. Results showed that information asymmetry increased before forecast earnings announcement but was reduced after it which this fact reflected the informational content of forecast earnings announcement [4].

According to Mehrani and Rasaeian (2009) information asymmetry in market increased adverse selection costs and in this way influenced share bid-ask spread [4].

Research Methodology

According to the above-mentioned, present study seeks to answer these questions:

- 1- Does actual earnings announcement lead to decrease in information asymmetry?
- 2- Does forecast earnings announcement lead to decrease in information asymmetry?
- 3- Is there any relationship between information asymmetry and earnings forecast error?

In order to answer the above questions and according to theoretical bases in this field, the following hypotheses are formulated:

H1. Information asymmetry decreases in the period after actual earnings announcement compared to the period before it.

H2. Information asymmetry decreases in the period after forecast earnings announcement compared to the period before it.

H3. Information asymmetry has a significant relationship with earnings forecast error.

Present research was conducted on firms listed in Tehran Securities Exchange in a five-year period of 2006-2010. Statistical population of research consisted of all cases of earnings announcement for firms listed in Tehran Securities Exchange among them those meeting required criteria for present research were selected as sample. Among the reasons for selection of listed firms were presence of daily share price for those firms and the fact that they were required to provide annual earnings estimation per share and record their stock bid-ask spread. Given the five-year period of present study, the sample had to be chosen in a way that market was active in that period to enable testing of hypotheses. For this purpose the following design was employed for choosing sample members:

- 1- End of their fiscal year must be on 19th March.
- 2- They should have announced annual earnings estimations in the studied period.
- 3- They should have been active in studied days. For this purpose the interval of 21 days before to 21 days after actual and forecast earnings announcements which was the basis of present research was considered as a criterion to see if the firm was active or not.
- 4- They must not be an investing or brokerage firms.
- 5- They should have been listed in Exchange no later than 20th march 2005.

According to above conditions, 300 firm-years were selected as sample.

Present research was a descriptive and correlative one and data analysis was conducted using regression models and testing hypotheses based on f, t and DW (Durbin-Watson) statistics. Also present research was an applied one with respect to its results and a retrospective one respecting to study of data. In order to collect information and data, databank of Tadbir-Pardaz and Rah-Avard-e-Novin Software and financial statements of Tehran Securities Exchange were used and statistical software EVIEWS was exploited for data analysis and estimation of β s.

For testing two first hypotheses of present research, mean comparison test and t-test were used. Using t-test requires checking of variance homogeneity which is done by Fisher (f) test. In order to test third hypothesis, F limer-test was used for choosing between pooling or panel data

models and Hausman test was used to test model fitness. All statistical tests were conducted at error level 0.05.

Research Variable Measurement

Information Asymmetry

By studying H1 and H2, presence or lack of information asymmetry in Tehran Securities Exchange can be determined. The main goal of present research was to determine effect of management earnings announcement on information asymmetry. Information asymmetry is a qualitative concept. A model is required to quantify it so that it can be expressed in numerical form. For this purpose, bid-ask spread is employed. This model was used by Chiang and Venkatesh (1986) for determining bid-ask spread [8]. Since then other scholars also have exploited the model. The above-said model is as the following:

$$SPREAD_{i,t} = \frac{(AP - BP)}{\frac{(AP + BP)}{2}} * 100$$

Where:

SPREAD = stock bid-ask spread of firm i in the study period.

AP (ASK PRICE) = stock mean ask price of firm i in the study period.

BD (BID PRICE) = stock mean bid price of firm i in the study period.

In order to conduct calculations, at first the best bid and ask prices per share was extracted for 21 days before and 21 days after actual and forecast earnings announcements (the best bid price means the highest bid per share per day and the best ask price means the highest ask per share per day) and after calculation of stock bid-ask spread, pre- and post- announcement numbers obtained for each subject of the sample were averaged. The greater bid-ask spread, the more information asymmetry.

Earnings Forecast Error

EFE: in order to calculate earnings forecast error (EFE) data for actual net (realized) earnings and forecast earnings (provided by managers) of the firm were used. For this purpose, forecast earnings were deducted from actual ones and the residual was divided into firm's forecast net earnings. Formula for calculation of this variable is as the following:

$$EFE_{it} = \frac{AE_{it} - FE_{it}}{|FE_{it}|}$$

Where:

EFE_{it} : Earnings forecast error per share

: AE_{it} : Actual net earnings per share

: FE_{it} : Forecast net earnings per share

Research Findings

Table.1 Descriptive statistics of research variables

	mean	Median	Standard deviation	highest	lowest
Lack of forecast error	0.48	0.27	0.82	7.98	-0.48
Information asymmetry	10.7	6.52	18.35	112.2	-69.8
Firm size	13.48	13.32	1.26	16.57	10.99
Financial leverage	0.58	0.59	0.17	0.91	0.15
Institutional shareholder ownership percentage	76.9	82.26	18.2	98.8	9.3
Firm age	2.27	2.3	0.69	3.76	0.69

As can be observed in table1, given the closeness of median and mean and also other statistics obtained for various variables, it can be concluded that all variables are of appropriate distribution. Also in relation to variable of information asymmetry it should be mentioned that with respect to descriptive statistics of this variable, this variable has not a normal distribution and is biased towards right. This means information asymmetry is of a high variation among various firms.

Test of Hypotheses

Test of H1

Hypothesis 1 addresses to the question that if information asymmetry is different between the periods before and after corporate actual earnings announcements?

For this purpose, at first variable of information asymmetry was calculated for all sample firms for respectively 21 days before and after actual earnings announcements and relative descriptive statistics can be seen in table2. Then in order to calculate the extent of information asymmetry pre- and post-actual earnings announcement, independent two sample t-test was used to check parity of means for variable of information asymmetry. Also Fisher test was used to check parity of variances for variable of information asymmetry and the results are presented in table3. H0 of both tests is based on parity of means and variances of information asymmetry during the studied period.

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

Table.2 descriptive statistics of the variable information asymmetry pre- and post-actual earnings announcement

statistics	Pre-announcement	Post-announcement
mean	14.17	3.48
median	9.28	1.44
variance	23.26	20.29

Table3. Results of paired comparison test

Paired variables	test	statistics	Degree of freedom	Significance level	Test result
information asymmetry pre- and post-actual earnings announcement	Parity of means	5.99	598	0.000	H0 rejected
information asymmetry pre- and post-actual earnings announcement	Parity of variances	1.313	(299,299)	0.019	H0 rejected

According to the obtained results and significance levels for two tests which were respectively 0.000 and 0.019, parity of means and variances of two populations were rejected at confidence level of 95% and it can be concluded that their means and variances are significantly different from each other. In other words, information asymmetry is different between pre- and post-actual earnings announcements. According to the obtained result, H1 was supported. Also according to descriptive statistics of two groups provided in Table2, it can be said that information asymmetry pre-actual earnings announcement is more than one post-actual earnings announcement.

2-6-4-Test of H2

H2 addressed the question that whether information asymmetry is different between pre- and post-forecast earnings announcements?

For this purpose, at first variable of information asymmetry was calculated for all sample firms for respectively 21 days before and after forecast earnings announcements and relative descriptive statistics can be seen in table4. Then in order to calculate the extent of information asymmetry pre- and post-forecast earnings announcement, independent two sample t-test was used to check parity of means for variable of information asymmetry. Also Fisher test was used to check parity of variances for variable of information asymmetry and the results are presented in table5. H0 of both tests is based on parity of means and variances of information asymmetry during the studied period.

$$H_0: \mu_1 = \mu_2$$

$$H_1: \mu_1 \neq \mu_2$$

Table.4 descriptive statistics of the variable information asymmetry pre- and post-forecast earnings announcement

statistics	Pre-announcement	Post-announcement
mean	13.37	10.48
median	8.33	6.53
variance	18.35	22.02

Table5. Results of paired comparison test

Paired variables	test	statistics	Degree of freedom	Significance level	Test result
information asymmetry pre- and post-actual earnings announcement	Parity of means	3.593	598	0.000	H0 rejected
information	Parity of	1.44	(299,299)	0.0017	H0

asymmetry pre- and post-actual earnings announcement	variances				rejected
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According to the obtained results and significance levels for two tests which were respectively 0.000 and 0.0017, parity of means and variances of two populations were rejected at confidence level of 95% and it can be concluded that their means and variances are significantly different from each other. In other words, information asymmetry is different between pre- and post-forecast earnings announcements. According to the obtained result, H2 was supported. Also according to descriptive statistics of two groups provided in table4, it can be said that information asymmetry pre-forecast earnings announcement is more than one post-forecast earnings announcement.

Test of H3 addresses the relationship between information asymmetry and corporate earnings forecast error. In order to test this hypothesis regression 1 was used.

$$(1) \quad EFE_{i,t} = \alpha_0 + \alpha_1 RSD_{i,t} + \alpha_2 INS_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 LEV_{i,t} + \alpha_5 AGE_{i,t} + \varepsilon_{i,t}$$

Where:

EFE: earnings forecast error

RSD: information asymmetry.

SIZE: in order to obtain firm size various methods e.g. number of employees, asset value, replacement value, etc. can be used. In present research firm size was obtained from normal logarithm of book value of total assets.

INS: percentage of stock held by institutional shareholders.

LEV: firm financial leverage obtained by dividing total debts into total assets of firm. In present research financial leverage is calculated using annual financial statements.

AGE: age of firm equals to the length of time the intended firm has been listed in Exchange. To calculate it, the time at which the firm listed in Exchange was deduced from the intended time and logarithm of it was calculated.

Firm size (SIZE), percentage of institutional shareholders (INS), financial leverage (LEV) and firm age (AGE) were added as control variables which can influence management forecast error

and potentially influence the relationship between earnings forecast error and information asymmetry in above equation.

Before model fitting, F limer-test was used to choose between pooling and panel data. H0 and H1 of this test are as follows:

$$H_0: \text{Pooled Model}$$

$$H_1: \text{Panel Model}$$

Results from present test are presented in table6.

Table6. Results of F limer-test

	statistics	Error level
Cross section F	1.656	0.005

As seen in table6, results suggest rejection of H0 at error level of 5 percent. Thus panel data is preferred. Therefore it is also necessary to perform Hausman test. H0 and H1 of present test are as follows:

H0= panel data method with random effects is preferred.

H1= panel data method with fixed effects is preferred.

Results of Hausman test are provided in table7.

Table7. Results of Hausman test

	Statistics	Error level
Cross section F	24.37	0.000

Results suggest that it is better to use panel data method with fixed effects to fit the model. In the following, the results related to statistical test of table1 is provided in table8.

Table8. Results of estimation of table1 using panel data

	Variable coefficient	t statistic	Error level
intercept	4.61	5.12	0.000
Information	0.631	8.43	0.000

asymmetry			
Firm size	-0.38	-5.11	0.000
Financial leverage	-0.075	-0.553	0.58
Percentage of institutional shareholders ownership	0.001	0.398	0.69
Firm age	0.439	4.19	0.000
Adjusted R2	0.166		
F statistic (error level)	1.93		
Durbin-Watson statistic	2.29		

As seen in table8, according to value of F statistic (1.93) and error level of it (0.000) it can be argued that in total the model is of high significance. Also according to adjusted R2 (17%) it can be argued that in total 17 percent of variations in dependent variables is explained by research independent variable.

In addition to this, based on Durbin-Watson statistics (2.29), it can be said that there is no first-order autocorrelations between residuals of research model.

According to results obtained from estimation of model, coefficient of information asymmetry variable is equal to 0.631 and according to its p-value (0.000) which is less than acceptable error level, H3 is supported at confidence level of 95 %. Support of H3 shows that there is a positive and significant relationship between information asymmetry and earnings forecast error.

Summary and conclusion

Main purpose for preparation of financial reports and statements is to provide financial information being effective in decision making of interested groups and also to provide information on financial situation and operational results so that it can be useful for a wide range of users in making economic decisions.

Management earnings forecast is one type of information being released by firms in order to reduce information asymmetry due to presence of informational risk in capital market.

Results of present research show that Tehran Securities Exchange has an informational asymmetry with consideration to corporate estimated earnings. But this information asymmetry in pre-announcement period is several orders of magnitude greater than one in post-announcement. This shows that announcement of accounting earnings and any other information to investors in a correct way reduces information asymmetry to a great extent. In present research, announcement of forecast and actual earnings by management was able to make market aware of actual condition of firm and reduce information asymmetry. On the other hand the results show that information asymmetry has a positive and significant relationship with earnings forecast error. Results of present research are consistent with those conducted overseas but some researchers reported information asymmetry in the period after earnings announcement. For example, Ushman and Morse (1983) and Chiang (1986) studied companies of New York Exchange and detected information asymmetry in the period after earnings announcement. Libby et.al, (2002) showed that bid-ask spread before earnings announcement was wider and less deep. Results of Collier and Yohn (1997), showed that information asymmetry of forecasters increased on disclosure day and the day after it.

In Iran, Mehrani and Rasaeian (2009) reported that information asymmetry in market influenced share price through bid-ask spread. Results of a study by Qaemi and Vatanparast (2005) showed that information asymmetry was intensified before earnings announcement but after earnings announcement it decreased and this fact was reflective of informational content of estimated earnings.

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