Factors Affecting Bias in Management Earnings Forecasts

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ABSTRACT

In this paper the effects of five factors, firm size, degree of financial distresses, growth rate, off-organization financing and price control on management earnings forecasts are studied. The findings of this study show the earnings are forecasted optimistically; also it shows that off-organization financing affects the management earnings forecasts, which leads us to accept the research hypothesis. We find relationships between firm size, degree of financial stresses and management earnings forecasts, but in the wrong direction as the research hypothesis expected. The study did not confirm a meaningful relationship between growth rate, price control and bias in management earnings forecasts.

Keywords: 1. Bias in Management Earnings Forecasts 2. Degree of Financial Distress 3. External Financing 4. Size 5. Price Control.

1. INTRODUCTION

Capital markets are important part of today's economic environment. In an efficient capital market, suppliers and those demanding money should achieve their goals. The goal of a supplier of money is to earn the highest return and the goal of a demander of money is to finance its needs in a cheapest way.

Accounting provides information for participants in the market to make decisions. Companies, by publishing financial reports, help investors in accessing financial position and evaluating performance of the company.

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Management usually makes voluntary disclosure to assist decision-makers who are relying on financial information provided by the company. Such disclosure could be on future prospects of the company, future cash flows and forecasts of sales and earnings. The question is whether information provided by management on voluntarily basis is reliable? Management is after securing its position in the company. Thus, it is not surprising to see that information provided is to serve this need. Based on agency theory, because of asymmetry of information, management tries to increase it interest in the company by providing biased information.

One of the voluntary disclosures is disclosing management earnings forecasts. Management forecast income statements for next period or some other future time periods. Researches done in this area indicate that, decision-makers use information contained in such forecasted statements in their decision models. See for example, Patell (1976), Ajinkia and Gift (1984), Waymire (1984), Hassel and Jenings (1988), Williams (1996) and Clement (2003). Khaleghi Moghadam (1998) finds that in Iranian capital market, investors use forecasted information in their decision models. All the above studies indicate that, forecasted earnings by management have information content.

Based on agency theory management disclose information in a way that is on its best interest. This theory also dominates the forecast of earnings, since managements' decision to voluntarily disclose forecast on earnings may be motivated by underlying incentives. Bias on forecasts earnings exists if expected value of observed forecast differs from actual earnings (Irani, 2001). Firth and Smith (1992), Frost (1997), Kang and Silhan (1997), Betker, et. al. (1999), Ota (2002) and Irani (2001, 2003) find that management earning forecasts has some degree of bias. They study the factors that motivate the bias in the forecasts.

In this study we investigate the effect of five firm characteristics on bias in management earnings forecasts of the companies in Iranian capital market. According to the Iranian capital market regulation issued in 1997, disclosing earnings forecasts is mandatory. These firm characteristics are: firm size, financial distress, growth rate, external financing and price control.

2. TEST VARIABLES AND HYPOTHESES

Firm size - Hagerman and Ruland (1979) argue that larger firms have this potential to prepare more accurate earnings forecast, since they are operationally more diverse and can take environment volatility better than

small firms. Cox (1985) also argues that larger firms have human resources in preparing good quality forecasts; moreover their earnings process is settled and more predictable than smaller firms. Ota (2002)   points out that managers of large firms may regard earnings forecasts as commitments to interested parties, their projections therefore, tend to be conservative in order to avoid missing the forecasts.

The findings of previous research are inconclusive. Davidson and Neu (1993) and Clarkson (2000) using Canadian companies study the effect of firm size on the precision of forecasted data in initial public offering of stocks. They report that larger companies published more accurate forecasts. Choi and Ziebert (2000) using US sample study the effect of firm size on MEF and report that the firm size is related to the bias on MEF. Firth and Smith (1992) study New Zealand companies and report that forecast among smaller companies are more accurate than of those for larger companies. The same findings also are reported by Chan et al (1996).

The measure of firm size in this study is total assets of the companies in the sample. In our study we use the natural logarithm of the total assets as a measure of firm size in order to avoid the non-linear aspect of the model.

Therefore, the statistical hypothesis and regression model of size variable is as follow:

$H_{1A}:B_1>0$
$MFERR=B_0+B_1 (Size)$

Where:

the natural logarithm of the total assets. Size =

It is expected that larger firms, forecast earnings more pessimistically, therefore, bias in their earnings forecasts is expected to be positive and the sign of B1 to be positive too.

Financial distresses - Previous researches indicate that there is a relationship between financial distress and MEF. Betker et al (1999), indicate that firms having financial distress or those expecting bankruptcy in near future would report optimistic earnings forecast to draw a better picture of their companies. The same findings can be found in Irani (2001, 2003). Koch (2001) reports that management earnings forecasts disclosed by companies experiencing financial distress are optimistic and financial analysts give less credit to them. Frost (1997) using 81 UK firms having financial distress, finds that MEF of such firms are highly optimistic. Betker (1999) and Ota (2002) find similar results in States and Japan.

Size = Log of total assets

$$TLTA = \left(\frac{TotalLiabilities}{TotalAssets} \right)$$

$$WCTA = \left(\frac{WorkingCapital}{TotalAssets} \right)$$

$$CLCA = \left(\frac{CurrentLiablities}{CurrentAssets} \right)$$

$$NITA = \left(\frac{Earnings}{Totalassets} \right)$$

$$FUTL = \left(\frac{OperatingCashFlow}{TotalLiabilities} \right)$$

$$INTWO \begin{cases} 1 \text{ if earnings were negative for the last two periods} \\ 0 \text{ otherwise} \end{cases}$$

$$OENEG \begin{cases} 1 \text{ if total liabilities exceed total assets} \\ 0 \text{ otherwise} \end{cases}$$

$$CHIN = \frac{E_t - E_{t-1}}{|E_t| + |E_{t-1}|}$$

The financial distress is measured based on the above nine variables from the following equation:

$$DFD_i = \frac{EXP(y_i)}{1 + Exp\, y_i}$$

Where, DFDi, is the degree of financial distress in firm *i*,

Exp (yi) = -1.32 – 0.407(Size) + 6.03(TLTA) -1.43 (WCTA) + 0.0757 (CLCA) - 2.37 (NITA) - 1.83 (FUTL) + 0.285 (INTWO) - 1.72 (OENEG) - 0.521 (CHIN)

If the DFD in the above model is high it shows that the firm is in financial distress. In this study using the above relationship the sampled firms are ranked according to their financial distresses and the relevant hypothesis is tested. It is expected that firms with financial distress tend to issue optimistic earnings forecasts.

A question may be raised that the relationship between financial distress variable and error in earnings forecasts is caused by size variable in the Ohlson's (1980) model. To answer this question an univariate regression model is constructed and regressed backward to test the effect of size variable. If the effect of size variable in the univariate regression is material, then we conclude that size has an impact on the results of the hypothesis testing.

Firm's growth rate – Some researchers are concerned that disclosing information to investors may harm the competitive ability of the company, (see for example, Wangenhofer, 1990, Feltham and Xie, 1992, Newman and Sansing, 1993, Darrough and Stoughton, 1990 and Giler 1994). One of the competitive advantages of a company is having high growth rate of earnings. Firms that have such a good earnings growth may deny it until reaching a stable situation. Healy and Palepu (2001) and Irani (2001) argue that firms expecting to report abnormal (i.e. above industry average) earnings growth would like to maintain their competitive edge as long as possible by trying to protect the information that led to their strong earnings performance. They do it by slowly releasing this information, through pessimistic voluntary and normal earnings releases.

Ota (2002) finds that firms with abnormal earnings release pessimistic forecasts. The same finding is also confirmed in Irani (2001). Richardson, et.al. (1999) report that firms with abnormal earnings growth are more willing to direct the forecast of the analysts to a more pessimistic one. Choi and Ziebart (2000) have not found any evidence to support the relationship between abnormal earnings growth and pessimistic forecasts.

In this study we use Ota's (2002) measure of growth, which is the ratio of last year sales to the sales of a year before.

$$Growth_i = \frac{Sales_{t-1}}{Sales_{t-2}}$$

Previous studies show that high-growth firms have more incentive to report pessimistic forecasts. Matsumoto (1999) and Richardson et al. (1999) find that high-growth firms are more likely to guide analysts' forecasts downward to meet their expectations at the earnings announcement.

The following regression model is used to test the relevant hypothesis

$MFERR_i = B0 + B1(Growth) + \epsilon t$

External financing - Irani (2001) argues that firms intend to do financing through capital market may release optimistic forecast. Ota (2002) makes a distinction between firms making equity financing and firms making bond financing and report that the forecasts of firms issuing stock are pessimistic, but no such relationship exist for firms issuing bonds. Marqurdt and Weidman (1998) findings indicate firms that are issuing equity for the second time tend to release optimistic forecasts.

Lang and Lundholm (2000) find no relationship between external financing and optimistic forecasts. The same finding is also confirmed in Irani (2001).

To Measure external financing variable sampled firms are divided into two groups. First those firms which issued equity stock in 2001, and second group are those which did not issue equity stock in the same period. Since at the time of study Tehran Stock Exchange was not involved in issuing any debt instruments, issuing equity is considered as the only source of external financing.

As discussed in the literature, managers may exhibit optimism in their forecasts if their firm is planning to access the capital markets in the near future. The optimistic forecasts of earnings causes negative error. Thus it is assumed that the mean of error in future earnings forecasts for firms doing external financing is more negative than for those firms not involved in external financing. Test of means is performed to investigate the impact pf external financing on management bias in forecasting future earnings.

$H1D :$ $\mu 1 ‹ \mu 2$

Where: $\mu 1 =$ mean of bias in earnings forecasts of the firms which did external financing.

$\mu 2 =$ mean of bias in earnings forecasts of the firms which did not external financing.

Price-regulated industries - Some may argue that managers are worried about the level of disclosure which may harm the competitiveness

of their firms. The positive accounting theory by Watts and Zimmerman (1986) suggest that managers in price-regulated industries tend to report pessimistic earnings forecasts, since they do not want to appear overly profitable firms. Studies by Darrough and Stoughton (1990), Wangenhofer (1990) and Ota (2002) provide evidence to support the above claim.

The above arguments support the view that there is a relationship between the level of industry competitiveness and the way that management make earnings forecasts.

Cement, drugs, automobile, petrochemical and food (only some companies) industries are price- regulated either by government or related unions. To test this hypothesis, test of means is conducted. For this purpose sampled firms are divided into two groups, firms in non-competitive (price-regulated) industries and firms in competitive industries (not price-regulated).

As discussed before, pessimistic forecasts of future earnings, cause positive bias. Therefore, it is expected that mean of bias for firms in price-regulated industries to be more positive than those for firms in non-price regulated industries. The statistical hypothesis is as follows:

H1E: µ1 ›µ2

Where:

µ1= mean of bias in earnings forecasts of the firms in price-regulated industry.

µ2 = mean of bias in earnings forecasts of the firms not in price-regulated industry.

This section presents the variable definitions, the sample selection, and the statistics used to test the hypotheses.

Management earnings forecasts – Forecast error by management may be intentional or unintentional. If such errors are related to the variables such as external financing or buying and selling large number of stocks by managers, it is called intentional error. Intentional error is the main concern in this research. Therefore, those variables that are expected to cause bias in management earnings forecasts are defined in this study.

Intentional or unintentional error as dependent variable in this study is calculated from the following formula:

$$MFERR_{i,t} = \frac{AE_{i,t} - FE_{i,t}}{AE_{i,t}}$$

Where:

$MFERR_{i,t} =$ management forecast error for firm i in period t,

actual earning per share for firm i in period t,

$AE_{i,t} =$

$FE_{i,t} =$ forecasted earning per share for firm i in period t.

This method of calculating management earnings forecasts error is used by Ajinkia and Gift (1984). When the outcome of the above formula, percentage of the error, is positive, then management earnings forecast is pessimistic, because actual earning per share exceeds forecasted earning per share. On the other hand if the percentage of the error, is negative, then management earnings forecast is optimistic, because forecasted earning per share exceeds actual earning per share.

Based on the above arguments we set up five hypotheses as follows:

1. The larger firms in size, publish more pessimistic earnings forecasts.

2. The higher the level of financial distress, the higher the degree of optimism in management earnings forecasts.

3. The higher the growth rate in earnings, the higher is the degree of pessimism in management earnings forecasts.

4. The larger the level of external financing, the higher is the degree of optimism in management earnings forecasts.

5. The lower the level of industry competitiveness, the higher is the degree of pessimism in management earnings forecasts.

3. SAMPLE SELECTION

The population of this study consists of all companies listed on Tehran's stock Exchange during the period of 1999-2001. The focus of the study is on year 2001, but we need data of 1999-2001 for estimating growth rate. The bias on forecasting future earnings is estimated for year 2001. The sample firms of this research were those firms still listed on T.S.E in 2001. Since banks and investment companies due to their capital structure and their operations are different from the other firms in the sample, they are excluded in this study. Finally a sample of 51 firms is selected randomly for the purpose of this research.

Required data is collected from Tadbirpardaz software. The main advantage of this source of data is the fact that it provides a true picture of the original financial statements of the firms under study, therefore, the collected data is the one reported in financial reports. SPSS, statistical

software is used for the data analysis in this study.

4. VALIDITY OF THE DATA

To increase the validity of the collected data first we used randomly collected data, according to Ajinkia and Gift (1984) this is an effective way of eliminating or reducing disturbing variables. We have only taken on board the forecasts which are prepared during first four months after publishing financial reports. The closer the time of the forecasts to the report of actual earnings, the less error may occur in the forecasts. Therefore, those firms which their forecasts were prepared more than four months after reporting their actual earnings were eliminated from our sample.

In the third step we have tried to select firms in our sample which their financial statements have more or less the same quality. Thus, audited financial reports were used in this study4.

To enhance the validity of the data we have tried to increase he sample size. Also we have tried to select our sample from all active industries.

5. FINDINGS

Descriptive statistics - table 1, reports the descriptive statistics of the earnings forecast error for the sampled firms in 2001.

Table 1: Descriptive statistics

Year	No. of firms	Mean	Std. Dev.	Median
2001	51	-0.08	0.32	-0.01

The median of the errors in earnings forecasts is negative, which means optimistic earnings forecasts by management. Irani (2001) and Bamber and Cheon (1998) report the same findings in their studies.

Findings for the first hypothesis-Size – In this hypothesis we expected that SIZE causes pessimistic earnings forecast, in other words the larger firms tend to report more pessimistic earnings forecasts.

Table 2, shows a significant association between the SIZE and type of earnings forecasts, but the sign of the relationship is opposite to our expectation. A significant and negative relationship between the two variables exists.

Table 2: Results of testing hypothesis one to three

No. of firms	Hypothesis	R	R²	P-Value	α	Result
49	One	-0.31	0.09	0.01	0.05	Reject
51	Two	0.27	0.07	0.03	0.05	Reject
48	Three	0.037	0.001	0.4	0.05	Reject

Findings for the second hypothesis-Financial distress

We have expected that the higher the financial distress the higher is the degree of optimism in management earnings forecasts. To measure the financial distress we have used Ohlson's (1980) bankruptcy probability model. Table 2. Reveals that, there is significant relationship between the degree of financial distress and management earnings forecasts. The sign of this relationship is opposite to our expectation, which means the higher the degree of financial distress the higher is the degree of pessimism in management earnings forecasts.

Size as a separate variable is used in the first hypothesis testing; also in Ohlson's bankruptcy probability model SIZE is an important variable. It could be thought that the reason for rejecting the second hypothesis is for the SIZE variable which also appears in financial distress variable. To become clear about this issue, a multivariate regression model consisting of two independent variables namely, SIZE and financial distress (DFD) is conducted. Then the regression model is worked backward. This type of analysis works in a way that if two or more independent variables are entered into the model then, one which has low or no impact on the dependent variable is taken out and the test was repeated. Using this test increases the internal validity of the research, because the effect of moderator variable is controlled.

After conducting this analysis, two regression models are obtained as below:

Initial model is:

MFERR = -0.03 – 0.04(SIZE) + 0.3 (DFD)

Secondary model is:

MFERR = -0.06 – 0.04(DFD)

In the first model both SIZE and DFD is introduced, but in the second model only DFD variable is remained as independent variable. This means that SIZE as a single variable has no significant role in the financial distress variable.

Table 3: Backward regression test of SIZE and DFD

Models	Dep't variable	R DFD	R SIZE	R^2 DFD	R^2 SIZE	P-value DFD	P-value SIZE	α
Initial	MFERR	0.25	-0.19	0.29	0.09	0.036	0.056	0.05
Secondary	MFERR	0.25	-	0.25	-	0.036	-	0.05

Table 3 shows that in the initial model both variables are introduced, but since the p-value of SIZE variable is greater than 0.05, then in the backward regression test this variable is eliminated. Therefore, only DFD variable remained in the model and shows a significant relationship with management earnings forecasts error.

Findings for the third hypothesis - Growth rate – For testing this hypothesis we have expected that firms with higher growth rate of abnormal earnings make more pessimistic earnings forecasts. Table 2 reports no association between these two variables in this study.

The p-value in testing this hypothesis is not significant (0.4) therefore, Ho is accepted.

Findings for the fourth hypothesis- External financing – Firms that have done external financing prior or during the earnings forecasts period tend to make optimistic earnings forecasts. In this study we have divided the sample firms into two groups. First those firms which during earnings forecasts used external financing and second group those firms which did not do external financing during earnings forecasts period. Table 4 shows the mean error of earnings forecasts for the firms used external finance 0.21 and 0.008 for the firms did not use external finance. The difference between these two numbers even without any statistical test shows a significant difference.

Table 4: Results of testing hypothesis four and five

No. of firms	Hypothesis	No. of group 1	No. of group 2	Mean of Error (1)	Mean of Error (2)	P-value	α	Result
48	Four	8	40	0.21	0.008	0.04	0.05	accept
48	Five	16	32	0.01	0.047	0.47	0.05	reject

The statistical test at 5% significance level proves that there is a meaningful difference between the two means. This indicates that firms used external financing tend to forecast earnings more optimistically.

Findings for the fifth hypothesis- price controlled industries – when setting up this hypothesis we have expected that firms in price regulated industries tend to forecast earnings pessimistically. In the sample of this study, cement, drugs, automobile, sugar and petrochemical industries are price regulated by government.

Table 4 reports that firms under study are divided into two groups, first companies in price regulated industries and second companies in non-price regulated industries.

Mean error of earnings forecasts for the companies in group one is 0.01 and for the companies in group two is 0.047**.** Based on the above statistics, the fifth hypothesis is rejected, which means there is no significant relationship between the level of industry competitiveness and the of earnings forecasts error.

6. CONCLUSION AND DISCUSSION

In this study we have expected that the size, degree of financial distress, growth rate of abnormal earnings, external financing and level of industry competitiveness, have some meaningful impact on management earnings forecasts bias.

The external financing hypothesis was approved, therefore, firms which during earnings forecast period issued ordinary shares, had made optimistic earnings forecasts. Firm size and the degree of financial distress proved to have a significant relationship with the degree of error in management earnings forecasts, but the signs were opposite to our expectations. In testing the degree of financial distress we have controlled the firm size, since one of the factors in measuring the degree of financial distress is firm size.

We found no significant relationship between growth rate of abnormal earnings, the degree of industry competitiveness and the management earnings forecasts errors. In the following section we compare our findings with similar studies in other countries.

Firm size- opposite to our assumptions our findings indicate that management in larger firms tend to make an optimistic earnings forecasts. This result is similar to the result of Choi and Ziebart (2000) study, but opposite to the result of Ota (2002) study. One reason for our finding regarding the firm size hypothesis is what Chan et.al. (1996) expressed. They believed that market less tolerates the bias in management earnings forecasts of smaller firms.   Therefore, smaller firms avoid making unattainable earnings forecasts.

The degree of financial distress- The results of our study indicate that

after controlling for firm size variable, the degree of financial distress is associated with pessimistic earnings forecasts. This is opposite to our expectations. This finding is not in accordance with the findings of Frost (1997), Koch (2001), Irani (2001, 2003), Betker et.al. (1999) and Ota (2002).

Our findings in Iran capital market could have two reasons. First, since providing earnings forecasts is compulsory, auditors are rigid towards firms which are in trouble in making optimistic earnings forecasts.

Growth Rate – We have hypothesized that the higher the growth rate of abnormal earnings, the more pessimistic is management made earnings forecasts. Our findings did not give support to our expectation in this hypothesis. This finding is consistent with the findings of Choi and Ziebart (2000) study. They did not find any significant association between growth rate of abnormal earnings and management earnings forecasts. Our finding regarding growth rate is opposite to the findings of Ota (2002) and Irani (2001) studies. They found firms with higher growth rate of abnormal earnings make pessimistic earnings forecasts.

External financing- In this study we hypothesized that if firms in the period of making earnings forecast had made external finance, would have made optimistic earnings forecasts. Our findings confirmed an association between the two variables, which indicate that firms intended to issue common stocks had made optimistic earnings forecasts.

This finding is consistent with the findings of Marquardt and Weidman (1998) and Ota (2002), but is not consistent with the findings of Lang and Lundholm (2000) and Irani (2001).

Price-regulated firms-We assumed that in price regulated firms, management make pessimistic earnings forecasts. Results of this study indicate that there is no association between the two abovementioned variables. In other words, in Iran's capital market there is no relationship between the way that firms are price regulated and the types of earnings forecasts. Irani (2001) found the same results as we did the present study. Ota (2002), Kang and Silhan (1997) found different results.

One reason for our findings could be that in Iran price regulation in some industries is not equivalent to giving monopolistic right to some firms. In one industry there are several firms and because government finds their products strategic products, may regulate their prices. Example of such industries is food industry.

7. LIMITATIONS

First limitation of this study is the effect of disturbing variables on the results. Variables as such are the firm's life period, management incentive plans, past errors in the earnings forecasts, level of managers education and experience, are variables which could have had some reasonable impact on the results of this study.

Data collection in this research was done based on some software, documents of the sampled firms and so on.   Problems like lack of information, omission of data in some firms were some other limitations in this study.

The third limitation of present research is our concern with quantitative earnings forecasts, where as management may release loads of data apart from financial reports.   Therefore, the results of this study could only be inferred to qualitative earnings forecasts.

8. DIRECTION FOR FUTURE RESEARCH

There are some potential avenues being handy for future research. Future research could take on board the impacts of variables such as, firm's life, past errors in management earnings forecasts, management incentive plans on the earnings forecasts errors.

In 1998, Khaleghi Moghadam studied the impact of earnings forecast on share price. Now after several years such study has merit of repeating to confirm the significance of such information in economic model of decision making.

The rate of the awareness of the investors and other users of financial reports of the errors in management earnings forecast could be another avenue for further research.

Next area for research in Iran is the study of the relationship between earnings forecasts and buying and selling shares by personnel of the firms.

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