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A Study of the Influence of the Financial Crisis and Income Smoothing on the Earnings Forecast Accuracy by Managers of Listed Companies in Tehran Stock Exchange

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Abstract: Forecasted earnings provide significant information for investment and other financial statements users. In recent years, a large number of studies have considered the forecasted earnings accuracy by management. In this research, the influence of financial crisis and income smoothing on the earning forecast accuracy by managers of listed companies in Tehran Stock Exchange is examined. To achieve the study objectives 130 companies listed in Tehran Stock Exchange have been reviewed in the five year period of 2007 to 2011. Two populations mean comparative t- student test has been used to study the accuracy of the results obtained from the hypotheses tests. Research findings show that income smoothing variable can effect on earnings forecast accuracy, but financial crisis has not been affective on earnings forecast accuracy.

Key words: Earnings Forecast Accuracy, Financial Crisis, Income Smoothing

INTRODUCTION

In the present context, many natural and legal shareholders have had active presence in Tehran Stock Exchange, and make decisions largely based on published information. So it is expected that corporate executives inform the market their prediction accurately. However, research results[1] show that the actual financial performance of companies in many cases are significantly different from the forecasted performance of them. This issue can be investigated as the "accuracy of earnings forecasts by companies."

Generally there are differences between the forecasted earnings by management of exchange companies and the actual earnings of the companies. One reason for this is that the management of listed companies does not forecast the corporate earnings accurately. But given the role of forecasted earnings on the pricing of company's common stock, [2] and their impact on investors' judgments [3] and the role of forecasted earnings in the past on future earnings forecasts [4], the company management should identify major and influencing factors in earnings forecast precisely in order to increase the accuracy of their predictions.

Research theoretical bases

Human is a prospective being and tries to predict events before they occur. To perform a better prediction of a subject, initially he tries to identify the factors that effect on the subject to predict more accurately.

One of the things that managers of listed companies on the Stock Exchange are required to do is forecasting the corporate earnings. One of the duties of the executives, based on which the financial managers' duties are defined, included evaluating the previous status through the use of various quantitative and qualitative tools and techniques, and drawing and forecasting the future favorable conditions. Research suggests that there are several factors such as the financial crisis, the management experience in earnings forecasting, firm age, firm size, financial leverage that are effective on the earnings forecast accuracy. Most of these factors can be calculated using the financial statements of companies and their effect on the accuracy of forecasting can be investigated .

There are several models to predict earnings. These models are not accurate enough, and the predictions performed by professionals including analysts are more accurate than the predictions made by these models [5] but the accuracy of prediction of these professionals is also affected by various factors. For instance, [6] indicated that the accuracy of analysts' prediction has a direct relation to their experience as well as to the quantity of the companies that they analyze. The accuracy of prediction in different countries can be affected by factors such as tax or accounting principle. In the present study, the influence of financial crisis and income smoothing on the earning forecast accuracy by managers of listed companies in Tehran Stock Exchange is investigated.

Earnings forecast:

The earnings forecast help the investors to improve their decision-making process and decrease their decisions risk. They are interested in the estimation of the future benefits of their investments, and they like to judge receiving of the future cash dividend and their shares value. Being in the Company, Corporation managers are those users of financial statements that, relative to others, have more information. To some extent earnings forecast causes to minimize the prediction error rate [5].

Generally people in their predictions try to predict the desired subject in a way that is closer to reality. If the prediction deviates from the truth, it has not been done accurately. When the forecasted earnings are less than the actual earnings, it can be concluded that the earnings may be predicted with sufficient accuracy. Conversely, when the deviation rate of forecasted earnings is higher than the actual earnings, it may be concluded that the earnings is not predicted with sufficient accuracy [6]. Therefore, the increase of the error and deviation rates of earnings forecast means the reduction of earnings forecast accuracy by the company management. The prediction deviation can be positive or negative. A positive deviation means that the actual earnings are greater than the forecasted

earnings and negative deviation shows the greater forecasted earnings compared with the actual earnings.

Financial Crisis:

The financial crisis means the bankruptcy of the company.

Bankruptcy:

Bankruptcy occurs when a company's liabilities exceed the value of existing assets. Bankruptcy refers to the inability of a company's liquidity to continue operating and pay its maturing obligations. A business failure can result from an actual ceasing or a bankruptcy. Generally, companies may confront failure in one of the three forms of financial, economic, and legal. In the financial failure, the weakness is in the performance of obligations at maturity, existence of a financial straits, and lack of working capital. Lack of working capital is a sign that is resulted from other causes like weak capital structure with excessive current borrowing, high operating costs and similar items. Usually several reasons cause the failure. The most important reason for the company's bankruptcy is mismanagement of organizations. Managerial errors, high costs, poor financial activities, insignificant sales activities and high production costs, alone or in combination, can be a warning for corporate bankruptcy. Economic activity could be another reason for bankruptcy. The recession, changes in interest rates, rising inflation, fluctuations in raw material prices and international economic conditions are the economic reasons of organizations bankruptcy. Government decisions, adverse natural events and stage of firm life are the other causes of bankruptcy.

Income smoothing:

Income smoothing is a conscious action by management using special accounting tools to reduce the volatility in earnings. Due to the interchanges that take place in revenue and cost, the income of one or more fiscal periods will be modified and adjusted. In fact, income smoothing is a sagaciously action done by the management. In Kalhor accounting dictionary the definition of income smoothing is presented as such "income smoothing is any designed method to remove data anomalies like unusual ups and downs in the curve that could be the result of operational non-continuous conditions".

LITERATURE

Sabet examined the effect of five factors of firm size, the financial crisis, the growth rate, external financing, and prices control in the industry on the corporation's managers' bias in the prediction of the payment dividends. He concluded that smaller firms in comparison with larger firms do more pessimistic forecasts. In addition, by increasing financial crisis amount, more pessimistic earnings are released. However, in his research, he found no significant relation

between firm growth and prices control in the industry and the bias in earnings forecasts[7].

Ghasemi has examined the earnings forecast accuracy of the managers with earnings forecast based on the Box-Jacknes method. The examination of the evidences from 48 companies listed in Tehran Stock Exchange during 1989-2003 showed that the expectation accuracy of the management is much higher than the time series model of Box-Jacknes[8].

Bahramian evaluated the expectation accuracy of earnings per share of the companies whose stock for the first time is public offering on the stock exchange, and the companies which raise capital on the stock exchange. The results of this research for the period of 2000 to 2002 including 81 companies indicate that earnings forecast error has a direct relationship with forecast period and the fluctuations of stock total index. There is no significant relation with regard to the firm size, firm life, and the degree of financial leverage, the auditor opinion, and the industry stage[9].

Mehrani and Hesarzadeh examined the relationship between earnings volatility and forecast probability of accounting earnings in the short term and long term time horizon. This study confirmed a significant inverse relationship between earnings volatility and forecast probability of accounting earnings and showed that firstly, historic earnings are important in predicting future earnings and secondly, earnings stability is a key factor regard to the analysis of the relationship between earnings volatility and their forecast probability[10].

Elton and Graber have studied the accuracy of earnings forecasts. They compared analysts' prediction with 9 models at time series from 1964 to 1966. The investigations showed that smoothing model is the best time series model and earnings forecast by analysts is more accurate than time series model[11].

Baginski et al., compared the identification time of the expected earnings in two countries, America and Canada. They concluded that American companies will probably forecast the earnings when the bad news is close, but Canadian companies forecast the earnings when there is good news during the forecast period[2].

Firth and Smith used a sample of 89 New Zealand firms during the period of 1983 to 1986 to evaluate the accuracy of the expected earnings made by management and concluded that the average forecasting error was equal to -92%, the absolute average of the forecasting error was equal to 328% and the actual earnings was on the average, 92% lower than the expected earnings[12].

Choi et al., showed that while short-term forecasts help investments to predict short-term earnings better, these predictions may help to forecast long-term future earnings better[13].

MATEREAL AND METHOD

Research objectives

The main objective of this study was to evaluate the impact of the financial crisis and income smoothing on the accuracy of earnings forecasts by directors of

listed companies in Iran Stock Exchange. Guidelines provided based on the results of this study can be used by managers to make more informed predictions, in particular, take effective steps on earnings forecasts. Therefore, the main objectives of the research are presented as follows:

1. Investigating the earnings forecast accuracy in companies with critical financial situation, compared to other companies.

2. Investigating the earnings forecast accuracy in income smoothing companies compared with non-smoothing companies.

Research hypotheses and variables

Research hypotheses

First hypothesis: the earnings forecast accuracy in companies with critical financial situation, compared to other companies, is less.

Second hypothesis: the earnings forecast accuracy in income smoothing companies has a significant difference with non-smoothing companies.

Research variables:

In this study the dependent variable is the earnings forecast accuracy which is calculated as follows:

$$\left(\mathrm{EPS_{i,t}} - \mathrm{F_{ik,t}}\right)/\mathrm{ABEPS_{i,t}} = \text{Earnings forecast mistake by the managers}$$

Its components include:

$\mathrm{EPSi,t} =$ each actual reported share earnings for i company in t period

$\mathrm{Fik,t} =$ the k forecast of the managers for each share earnings of t period

$\mathrm{ABEPSi,t} =$ absolute value of each actual share earnings of t period

$\left(\mathrm{EPS_{i,t}} - \mathrm{EPS_{i,t-1}}\right)/\mathrm{ABEPS_{i,t}} =$ Earnings expectation mistake with accidental step model

In which:

$\mathrm{EPS_{i,t-1}} =$ each actual reported share earnings for i company in $\mathrm{t} - 1$ period

The independent variables in this research are:

Financial crisis (bankruptcy)

Bankruptcy is measured with various models, one of which we have considered for the study is Altman model (Z ''-SCORE). The model consists of five financial ratios, including: Working capital to total assets (X_1), accumulated income to total assets (X_2), income before interest and taxes to total assets (X_3), book value of equity to book value of liability (X_4), and sales to total assets (X_5):

$$Z'' = 0.717 \times 1 + 0.84 \times 2 + 3.1 \times 3 + 0.42 \times 4 + 0.998 \times 5$$

Complete bankruptcy case Z <1.2

The case between bankruptcy and non-bankruptcy

Health state Z> 2.9

Income smoothing

Ekle model is a method of measuring the smoothing. The statistical formula of Ekle index calculation is as follows:

ΔI= Earning changes during a period

ΔS= Sales changes during a period

CV = coefficient of variation for the considered variable (is obtained from the division of standard deviation of the considered variable by the mean of the same variable)

If $\frac{CV_{\Delta I}}{\mathrm{CV}_{\Delta S}} \geq 1$, the company is detected as a company which does not smooth the income. But if $\frac{CV_{\Delta I}}{\mathrm{CV}_{\Delta S}} < 1$, the company is detected as a company which smooth the income.

The statistical population and the statistical sample

The population of the study includes listed companies in Tehran Stock Exchange during the five-year period, from 2007 to 2011. Samples were selected by considering the following features:

- ✓ The companies which were present in exchange since the beginning of 2007 until the end of 2011.
- ✓ The companies whose stock in business is staggering since 2007 to 2011.
- ✓ The companies which ended their fiscal year at the end of March.
- ✓ The companies which are not investment companies, insurance companies or banks.
- ✓ The companies which can provide the information needed for research.

Applying the above conditions, 130 companies were selected to estimate the models and test the hypotheses of the research.

RESULTS

Research findings

In this study, collected data were calculated using Excel software and were analyzed by Spss software. Descriptive statistics of research variables included parameters of mean, median, standard deviation, elongation factor, minimum, and maximum will be examined in the first phase of the investigation, and then using a two sample comparative test (T-test) research hypotheses are tested discussed .

Research Descriptive Statistics

Table 1. Descriptive statistics of variables

	Y Earnings forecast accuracy	X1 Financial crisis	X2 Auditor Opinion	X3 Continuity of activity	X4 Income smoothing
Valid N.	120	120	120	120	120
Missing N.	0	0	0	0	0
Mean	-5466.1165	0.18	0.27	35.59	0.32
Median	-2194.5	0.0	0.0	38	0.0
Std. Deviation	29558.51565	0.382	0.444	13255	0.470
Variance	873705847.203	0.146	0.197	175.706	0.221
Skewness	0.889	1.723	1.069	-0.273	0.757
Std. Error of Skewness	0.221	0.221	0.221	0.221	0.221
Kurtosis	5,553	1.018	-0.873	-0.915	-1.452
Std. Error of Kurtosis	0.438	0.438	0.438	0.438	0.438

The first hypothesis test results

Hypothesis 1: Earnings forecast accuracy in companies with critical financial situation, compared to other companies, is less.

H0: Earnings forecast accuracy in companies with critical financial situation, compared to other companies, is not less.

H1: Earnings forecast accuracy in companies with critical financial situation, compared to other companies, is less.

Test results of hypothesis 1 are summarized in Tables 2 and 3:

Table 2. Descriptive statistics of the groups

Financial crisis		No.	Mean	St. dev	Mean sd
Earnings forecast accuracy	**critical**	100	18377.7730	24790.62635	2479.06263
	non-critical	20	16059.3600	20304.43733	4540.21021

Earnings forecast accuracy average of companies with critical and non-critical situation can be seen in the table above. Averages review shows that companies with critical financial situation, compared to companies with non-critical situation have greater earnings forecast accuracy.

Table 3. Two sample mean test

Financial crisis	Loan's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-taile	Mean Difference	Std. Error Differenc	95% Confidence Interval of the Difference

						d)		e	Low limit	High limit
Earnings forecast accuracy	**Equal variances**	1.03	0.312	0.39	118	0.696	2318.41	5909.31785	-9383.64	14020.47
	Unequal variances			0.448	31.4	0.657	2318.41	5172.93537	-8225.325	12862.15

The table of t-test results shows since the Loan test F =1.03 at the error level of 5%, is greater than 5%, (Sig =0.312). In this case, for continuing the examination, the first row of the t test will be used.

Test results show that as the value of the t statistic (t =0.392) is smaller than 2 and the significance level (Sig=0.696) is greater than 5%, so we accept the assumption H_0 that claims earnings forecast accuracy in companies with critical financial situation is the same as other companies, and reject H_1. That is to say, there is no significant difference between earnings forecast accuracy of companies that are in critical situation and are not in critical situation. Also, due to the fact that the high limit and low limit of two samples are positive and negative, in this case the mean difference of the two samples is not significant and the two samples mean equality is not rejected.

The second hypothesis test results

Hypothesis 2: Earnings forecast accuracy of income smoothing companies has a significant difference with non-smoothing companies.

H_0: Earnings forecast accuracy of income smoothing companies has no significant difference with non-smoothing companies.

H_1: Earnings forecast accuracy of income smoothing companies has a significant difference with non-smoothing companies.Test results of hypothesis 2 are summarized in Tables 4 and 5:

Table 4. Descriptive statistics of the groups

Income Smoothing		No.	Mean	St. dev	Mean standard deviation
Earnings forecast accuracy	**non-smoothing**	81	14557.6852	20780.72474	2308.96942
	smoothing	39	25122.8718	28690.77244	4594.20042

Descriptive statistics results of the companies show that the average of earnings forecast accuracy in non-smoothing companies and income smoothing companies are 14557.685 and 25122.871, respectively. With a glimpse on the surveyed companies means, we find out that earnings forecast accuracy of income smoothing companies, compared to non-smoothing companies, is higher but it should be tested to prove to this proposition .

Table 5. Two samples mean test

Income smoothing		Loan's Test for Equality of Variances		t-test for Equality of Means						
		F	P	t	df	Sig. (2-tailed)	Mean Difference	S.E Diff	95% CI	
									Low limit	High limit
Earnings forecast accuracy	Equal variances	7.7	0.006	-2.29	118	0.023	-10565.18	4603.38	-19681.14	-1449.22
	Unequal variances			-2.05	57.86	0.044	-10565.18	5141.79	-20858.1	-272.27

Regarding the table of t-test results, since significance level of statistic of the Loan test F =7.704 is smaller than 5%, (Sig =0.006). In this case, for continuing the examination, the second row of the t test will be used.

Based on the fact that the value of statistic t is greater than (t=-2.055) and its significance level (Sig =0.044) is smaller than 5%, then H_0 is rejected and we accept H_1. That's to say, we accept the hypothesis that earnings forecast accuracy of income smoothing companies has a significant difference with non-smoothing companies and with 95% confidence level, we reject the null hypothesis which states earnings forecast accuracy of income smoothing companies has no significant difference with non-smoothing companies. Also, due to the fact that the high limit and low limit of two samples are negative, the mean difference of the two samples is less than zero. In this case, the average of earnings forecast accuracy in the second sample (income smoothing companies) is higher than the average of the first sample (non-smoothing companies). These results can also be seen in the descriptive statistics table where the mean of non-smoothing companies is more than the mean of income smoothing companies.

CONCLUSIONS

In this research, the influence of financial crisis and income smoothing on the earnings forecast accuracy is examined. The results obtained from hypotheses testing indicate that among the hypotheses that have been tested, only income smoothing can affect earnings forecast accuracy and the financial crisis is ineffective on the accuracy of earnings forecast.

The test results of income smoothing hypothesis are consistent with the results of [2] examination based on "comparison of the identification time of the expected earnings in two countries, America and Canada". The hypothesis test related to the auditor opinion also corresponds with the examination results of [10], based on "the earnings forecast accuracy per share of the companies whose stock for the first time is public offering on the stock exchange, and the companies which raise capital on the stock exchange ". Test results hypothesis of

financial crisis is also consistent with [7] based on “examination of the effect of five factors of firm size, the financial crisis amount, the growth rate, external financing, and prices control in the industry on the corporation’s managers’ bias in the expectation of the earnings". According to the assumptions results and comparing them with previous studies, it appears that there are other factors that can influence the expected earnings. More research works are needed to identify these factors and in future studies this issue can be addressed.

Regarding the relationship between earnings forecast accuracy and income smoothing it is recommended that :

1. Managers do not consider the financial crisis benchmark in their earnings forecasts .
2. Analysts take income smoothing criterion into account in their assessments.

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