The Relationship between the Management Earnings Forecast Quality and Investment Decisions Based On Earning In Firms Listed In Tehran Stock Exchange

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Abstract

Earning prediction errors would reduce investments in labor and capital assets. The reason is that when there is a significant difference between the predicted earnings and actual earnings, it will reduce investments made in economic entities. Accordingly, the present study investigates the relationship between the management earnings forecast quality and investment decisions based on earning in a sample of 138 firms listed in Tehran Stock Exchange in the time period from 2009 to 2014. Pool linear regression model was used to test the research hypotheses. Results show that there is a positive significant relationship between the earnings forecast quality and investments in labor and capital assets. Besides, it was found that investments in labor and capital assets are higher in firms with a higher management earnings forecast quality than those with a lower management earnings forecast quality.

Keywords: the management earnings forecast, investment in labor, investment in capital assets

Introduction

Investment decisions in the business entities are usually taken using net present value(NPV) technique. According to this technique, managers need to make investments in projects with a higher net present value. To determine the NPV of the investment projects, future cash flows of the business entities must be calculated. When measuring future cash flows, financial analysts and investors do not only consider accounting profit figures but the sustainability and reproducibility of the reported earnings are also of high significance. They pay more attention to constituting items of earnings rather than their final figures. Therefore, if the expected future earnings and earnings sustainability are increased, business entities are expected to make more investments. In addition, as managers take their investment decisions based on the future profitability of business entities, such decisions are more likely to contain information about the quality of the predicted earnings by the management. Recent findings show that the increased earnings forecast quality would lead to more desirable investment decisions.

Theoretical Background

Investment as one the issues of financial economics and one of the main factors for solving economic problems faced by countries is the extension and development of investment (Jensen, 1986). This is not satisfactory by itself as in addition to investment development, increasing the capital adequacy is another important matter (Moddaress&Hesarzadeh, 2008). The financial assessment of investment project is the responsibility of managers and they should make optimal investment in projects that create value for the firm. In other words, the project with a positive NPV must be admitted and those with a negative NPV must be declined (Biddle & Hilary, 2006). Conceptually, the capital adequacy occurs when the company makes investments only in projects with positive NPVs. However, this scenario is only effective when the market conditions are perfect and there is no issue such as adverse selection and agency costs (Biddle et al., 2009; Verdi, 2006). The capital inadequacy is rooted in the agency theory, information economics theory, and issues such as agency costs and information asymmetry (Young & Jiang, 2008). Investment decisions can be assessed in terms of the difference between the paid wages to the labor in the current year compared to the wages paid in the previous year the show the investment in labor as well as the investment in capital assets (Feng, 2007). Accordingly, the increased payment to workers that shows the increased quantity or quality of human resources can improve the earnings quality. In addition, the increase in fixed assets and long-term investments will also improve the earnings quality. Therefore, making investments in labor and capital

assets can increase the earnings sustainability (Karimi&Sadeghi, 2010). The earnings quality is one of the important indicators of the financial health of companies that has captured the attention of creditors and other users of financial statements. The earning quality refers to the ability of the reported earnings to reflect the actual earnings, its usefulness in predicting future earnings, and also the stability and invariability of reported earnings (Black, 1980).

One of the factors reducing earnings quality is manage forecast errors as one of the most important discussions in behavioral finance theories that have its origins in psychology. Accordingly, it is believed that people in general are too optimistic. The scholars have extended this psychological background of behavioral finance and they see managers as a specific group that are different from ordinary people and that they can be more optimistic than others (Landier&Thesmar, 2009). According to Weinstein (1980)managers' over-optimism affects decisions taken by shareholders. This has been a major issue in the history of financing the firm (Huanget et al., 2010). Earnings forecast errors occur due to a conflict of interests between managers and shareholders and result in reduced investment in labor and capital assets. Because when there is a significant difference between the predicted earnings and actual earnings, it will reduce investments made in economic entities. Besides, the reduced quality of earnings forecast indicates mechanisms used to align the interests of shareholders and managers are not fully efficient (Jensen, 1986; Pawlina&Renneboo, 2005). Empirical studies found managers' individual characteristics especially the reduced quality of earnings has led to bias in investment decisions (Lin et al., 2000; Malmendier& Tate, 2005). In general, increasing the management forecasts quality will lead to a decrease in the investment inadequacy and in particular an increase in the rate of returns on investment (Biddle & Hilary, 2006; Biddle et al., 2009; Bushman & Smith, 2001; Lambert &Verrecchi, 2005; Verdi, 2006; Yang & Jiang, 2008). In the meantime, Verdi (2006) studied the relationship between the earnings forecast quality and the investment adequacy. Managers who always seek to gain the investors' trust try to publish information in a way that meets their desires. As a result, it appears that earnings forecast errors have a negative impact on the investment efficiency, ultimately leading to reduced investment in labor and capital assets. In the end, given the theoretical issues discussed about the quality of predicted earnings and investment in labor and capital assets and given that there are various studies in this regard and the lack of research in this field in Iran, the present study aims to examine the relationship between the management earnings forecast quality and investment decisions based on earnings in firms listed in the Tehran Stock Exchange.

Literature Review

This section addresses the previous studies conducted in the field. Fang (2009) studied the role of the accuracy of management earnings forecasts in estimatingmanagement earnings forecast errors. He concluded that there is a negative significant relationship between the accuracy of forecast and management forecast errors. This finding is consistent with the assumption that those forecasts are optimistic that are associated with lower levels of forecast accuracy. Besides, this relationship is stronger for forecasts with longer time horizons. Kato et al., (2009) investigated earning forecast by managers of firms listed in Japanese Stock Exchange and concluded that the first earning forecast is usually an overestimate of the actual earnings, but it is negatively adjusted and reduced over years.The results show that on average, these forecasts are laden with information. However, the forecast of earnings in companies with a poor performance and with managers who have poor and optimistic forecasts have low information content and thus are less reliable. Mcconomy(2009) studiedbias and accuracy of management earningsbased on the provisions dealing with management forecasts in Canadian companies. The results show that the forecasts investigated have significantly less positive (optimistic) bias than other forecasts. However, there was no significant correlation concerning the accuracy of forecasts. Chen and Hope (2011) in a study onfinancial reporting quality and efficiency of investment concluded that private firms have lower quality of financial reporting. In other words, companies with a lower number of investors or with more private investments have a lower quality of financial reporting. This is may be due to the reduced public need for financial reporting. Therefore, the quality of financial reporting in the private sector is less conducive to investment efficiency. Giannetti (2011) investigated the correlation between corporate governance indicators and investment efficiency and found that when there is more support for the rights of stakeholders there is stronger corporate governance. Accordingly, he concluded that institutional shareholders and board independence more or less reduce investments. In their study, Theodore et al., (2013) examined the relationship between the quality of management earnings forecasts and investment decisions in a sample of

215 companies over 2005-2012. They found that managers often use indicators such as operating cash flow to forecast earnings. It was also shown that managers predict earnings and return on assets. Accordingly, when earnings and rate of return on assets are predicted positively, investments made in the company will increase.

Hypotheses

Based on what was mentioned, three main hypotheses and two sub-hypotheses are developed and tested in this study:

Main Hypothesis I: There is a significant relationship between the quality of management earnings forecast and investment decisions based on earnings.

- o **Sub-Hypothesis I:** There is a significant relationship between the quality of management earnings forecast and investment in labor based on earnings.
- o **Sub-Hypothesis II:** There is a significant relationship between the quality of management earnings forecast and investment in capital assets based on earnings.

Main Hypothesis II: There is a significant difference in investment in labor based on earning between firms with a higher quality of management earnings forecast and firms with a lower quality of management earnings forecast.

Main Hypothesis III: There is a significant difference in investment in capital assets based on earning between firms with a higher quality of management earnings forecast and firms with a lower quality of management earnings forecast.

Methodology

The present study is a correlational research in terms of the method employed and an applied research in terms of its objectives. Besides, since historical data were used to test research hypotheses, it is considered as a quasi-experimental research. Epistemologically, this study is an empiricist research with a deductive reasoning system. Concerning the type of research, it is a field-library study that uses ex post facto historical data.

Model used to test hypotheses

The model used to test the research hypotheses is presented as follows:

$\beta_5 \text{STDS}_{it} + \beta_6 \text{STDCF}_{it} + \varepsilon_{it} + \text{ROA}_{it} + \beta_4 \text{QT}_{it} + \beta_3 o + \beta_1 \text{MFQ}_{i,t} + \beta_2 \text{SIZE}_{i,t} \text{ ICA}_{i,t} = \beta$

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Where, *ICA$_{i, t}$* is investment in capital assets, *IW$_{i, t}$*represents investment in labor, *MEFQ$_{i, t}$* is the management earnings forecast quality, *SIZE$_{it}$* is the firm size, *ROA$_{it}$* is return on assets, *QT$_{it}$* is growth opportunities, *STDS$_{it}$* is the standard deviation of sales, *STDCF$_{it}$* is the standard deviation of cash flows, and *ε*is themeasurement error in the model.

Dependent variable

The investment in labor as the dependent variable is calculated through the following model:

$Y_{it} = (\text{EMP}_{it} - \text{EMP}_{it-1}) / (\text{E}_{it} - \text{E}_{it-1})$

Where, CAPX is the amount of investment in a labor that is equal to the difference of wages payable this year and the previous year and E is earning in thebusiness entity (Feng Li, 2007).

Investment in capital assets

The investment in capital assets is calculated in this study using the following equation:

$Y_{it} = (\text{CAPX}_{it} - \text{CAPX}_{it-1}) / (\text{E}_{it} - \text{E}_{it-1})$

Where, CAPX is the amount of investment in capital assets which is equal to the purchase of tangible and intangible fixed assets and long-term investments and E is earnings in the business entity (Feng Li, 2007).

Independent variables

Management earnings forecast quality

According to the study conducted by Huang et al., (2010), the quality of earnings forecast is calculated based on the difference between predicted earnings and actual earnings. Besides, the greater the predicted earnings and actual earnings, the lower would be the quality of earnings forecast. It is noteworthy that in this study,the difference between predicted earnings and actual earnings is divided by the predicted earnings in order avoid the variance heterogeneity of the data in our data analysis.

Higher and lower quality earnings forecast quality

To measure higher and lower quality earnings forecast quality, first the median of the difference between the predicted and actual earnings were calculated and the value above the mean is called higherquality earnings forecast quality and the value lower than the median is called the lower earnings forecast quality (Huang et al., 2010).

Control variables

Control variables in this study are as follows:

- **Firm size:**It is the natural logarithm of assets (Ahmad Zadeh, 2012).
- **Financial leverage:** It is estimated as the ratio of the book value of corporate assents to the book value of corporate assets (ibid.).
- **Return on assets:**It is calculated as the net profit divided by average total assets (ibid.).
- **Growth opportunities:**It is measured as the sum of the book value of debts and the market value of equity divided by total assets (ibid.).
- **Standard deviation of cash flow from operations**: It is the standard deviation of cash flow from operations of the company in the past three years (ibid.).
- **Standard deviation of sales**: It is the standard deviation of the corporate sales in the past three years (ibid.).

      Results of Data Analysis

The following table shows the descriptive statistics for 828 firm-years:

Table 1: Results of descriptive statistics

Variable	Symbol	Mean	Median	Max	Min	SD
Investment in capital assets	ICA	0.197	0.051	5.553	-2.896	131/2
Investment in labor	IW	0.034	0.011	2.021	-0.813	0.312
Management earnings forecast quality	MFO	0.030	-0.037	7.870	4.468	1.025
Corporate size	SIZE	13.554	13.342	18.817	10.031	1.549
Financial leverage	LEV	0.606	0.619	0.976	045/0	0.201
Return on assets	ROA	0.187	0.141	1.272	-0.518	0.235
Growth opportunities	Q	1.477	1.242	7.159	0.564	0.750
Standard deviation of cash flows	STDCF	0.091	0.071	0.550	0.001	0.074
Standard deviation of sales	STDS	0.204	0.145	1.585	0.0007	0.213

Descriptive statistics can be divided into measures of central tendency, dispersion, and other measures. Measures of central tendency include mean and median while measures of dispersion include standard deviation. Other measures are minimum, maximum, skewness, and kurtosis. Table 2 presents the results of normality test:

Table 2: Results of normality test

Variable		K-S statistic	Asymp(sig)
Investment in capital assets	ICA	1.184	
Investment in labor	IW	1.149	
Management earnings forecast quality	MFO	1.125	
Corporate size	SIZE	1.362	
Financial leverage	LEV	1.115	
Return on assets	ROA	3.665	
Growth opportunities	Q	4.682	
Standard deviation of cash flows	STDCF	3.920	
Standard deviation of sales	STDS	5.824	

The results of Kolmogorov-Smirnov test show that the dependent variables followed a normal distribution and therefore parametric statistical methods are used.

To measure the stationary of data, the Augment Dickey Fuller test (ADF) was used in this study, the results of which are presented in Table 3:

Table 3: Results of Dickey-Fuller test

Variable	Number of lags	t	Sig.
Investment in capital assets	ICA	0	-29.245
Investment in labor	IW	0	-26.681
Management earnings forecast quality	MFO	0	-27.204
Corporate size	SIZE	0	-7.002
Financial leverage	LEV	0	-29.189
Return on assets	ROA	0	-10.728
Growth opportunities	Q	0	-16.011
Standard deviation of cash flows	STDCF	0	-27.918
Standard deviation of sales	STDS	0	-27.816

As it can be seen in the above table, all variables are stationary at a confidence level of 95%. Table 4 shows the results of testing the research hypotheses:

Table 4: Results of hypothesis testing

Dependent and independent variables	Investing in labor		Investment incapital assets	
	Coefficients	Sig.	Coefficients	Sig.
Management earnings forecast quality	0.161	0.000	0.353	0.000
Corporate size	-0.018	0.005	0.007	0.878
Financial leverage	-0.050	0.484	1.420	0.001
Return on assets	0.161	0.037	0.583	0.136
Growth opportunities	-0.034	0.006	-0.234	0.028
Standard deviation of cash flows	0.071	0.514	0.874	0.391
Standard deviation ofsales	0.024	0.660	-0.634	0.045
Constant	335/0	0.002	1.235	0.084
Management earnings forecast quality	0.161	0.000	0.353	0.000
The coefficient of determination	0.306		0.096	
Adjusted coefficient of determination	0.300		0.088	
Durbin Watson	1.859		2.066	
F statistic	51.824	Prob. 0.000	8.996	Prob. 0.000
Godfrey statistics	2.921	Prob. 0.054	0.728	Prob. 0.482
F-white statistics	7.303	Prob. 0.000	1.027	Prob. 0.426
F-limer statistics	0.634	Prob. 0.673	0.483	Prob. 0.788

As it is shown, the significance level of F-limer statistic is greater than the acceptable error level (P = 0.5), so (mixed) pooled data method is preferred over panel data method (panel). Besides, the significance level of F-white is less than 0.05 (P < 0.05), suggesting that the regression model has heterogeneity of variance. Therefore, after removing standard errors and heterogeneity of variance, the regression model has goodness of fit. Finally, as the significance level of Godfrey statistic is greater than 0.05, so the regression model is not serially correlated. Also, given that the significance level F-value is less than 0.05 (P < 0.05), the regression model has the explanatory power and since the value of Durbin-Watson statistic is 1.5 to 2.5, then we can conclude that the there is no auto-correlation problem among the research variables. Firstly, as the significant level of earnings forecast quality (independent variable) is less than 0.05, it can be said that there is a positive significant relationship between the earnings forecast quality and investment in labor. Besides, of control variables, corporate sizeand growth opportunities have a negative significant relationship withinvestment in labor. Besides, there is a positive significant relationship between return on assets and investment in labor. In addition,the value of coefficient of determination shows that changes in the

independent and control variables can explain 30.6% of the variances in the dependent variable. This finding is generally in line with the results of the study conducted by Theodore et al., (2013).

Secondly, the significant level of the earnings forecast (independent variable) is less than 0.05 thus it can be suggested thatthere is a significant positive relationship between the earnings forecast quality and investment in capital assets. Besides, of control variables, growth opportunities and the standard deviation of sales have a negative significant relationship with investment in capital assets. Furthermore, the value of coefficient of determination shows that changes in the independent and control variables can explain 9.6% of the variances in the dependent variable. This finding is generally in line with the results of the study conducted by Theodore et al., (2013).

Results of testing the second main hypothesis

Table 5: Results of hypothesis testing

Frequency		Mean		F	t	df	Sig.	Mean difference
High earnings forecast quality	Low earnings forecast quality	High earnings forecast quality	Low earnings forecast quality	27.780	4.572	826	0.000	0.098
414	414	0.083	-0.014	0.000				

Given that F-value (27.780) is significant (P < 0.05), the equal variance assumption of the two groups is not confirmed and thus independent t-test with adjusted degrees of freedom is used. In the next step, as the means are not equal, the significance level is considered. Since the t-value is equal to 4.572 with a significance level of less than 0.05, the means of the two groups are not equal at a confidence level of 0.95. In other words, investments in labor are higher in firms with a higher management earnings forecast quality than those with a lower management earnings forecast quality.

Results of testing the third main hypothesis

Table 6: Results of hypothesis testing

Frequency		Mean		F	t	df	Sig.	Mean difference
High earnings forecast quality	Low earnings forecast quality	High earnings forecast quality	Low earnings forecast quality	10.805	2.538	826	0.000	0.227
414	414	0.310	0.083	0.001				

Given that F-value (10.805) is significant (P < 0.05), the equal variance assumption of the two groups is not confirmed and thus independent t-test with adjusted degrees of freedom is used. In the next step, as the means are not equal, the significance level is considered. Since the t-value is equal to 2.538 with a significance level of less than 0.05, the means of the two groups are not equal at a confidence level of 0.95. In other words, investments in capital assets are higher in firms with a higher management earnings forecast quality than those with a lower management earnings forecast quality.

Conclusion and Suggestions

The main objective of the present study was to explore the relationship between the management earnings forecast quality and investment decisions based on earning in a sample of firms listed in Tehran Stock Exchange. The research hypotheses were tested separately and the results showed that there is a positive significant between earnings forecast quality and the investment in labor and capital assets based on earnings in firms with a high earnings forecast quality. It was also found that investments in labor and capital assets are higher in firms with a higher management earnings forecast quality than those with a lower management earnings forecast quality. The literature shows that earnings forecast errors occur due to a conflict of interests between managers and shareholders and result in the reduced investment in labor

and capital assets, because when there is a significant difference between the predicted earnings and actual earnings, it will reduce investments made in economic entities. However, this is true when the actual earnings are less than predicted earnings, because the difference in earnings is unfavorable. However, whenthe actual earnings are greater than predicted earnings, the difference is favorable and since there the firm gains more earnings than what is predicted, managers will increase investment in labor and capital assets. Therefore, the higher management earnings forecast quality leads to the investment adequacy and the increased return on investments. As there is a positive significant between earnings forecast quality and the investment in labor and capital assets based on earnings, organizations making audit polices and setting audit standards such as Audit Organization are recommended by setting binding standards to encourage managers to make more realistic predictions. Besides, Stock Exchange Organization is suggested to adopt regulations and rules that require companies to predict their earnings realistically in order to determine the actual value of companies, to clarify their information, and to provide a better understanding of their performance. Finally, in order to reduce risk; investors are recommended to take into account this point that the increased earnings forecast quality improves investment in labor and capital assets based on earnings.

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