A Survey of the Relationship between Earnings Management and Earnings Forecast Error and Economic Value Added in TSE

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ARTICLE INFO

Article history:
Received 8 September 2013
Received in revised form 21 October 2013
Accepted 29 October 2013
Available online 10 November 2013

Keywords:
Economic Value Added (EVA), Net Forecast Earnings perShare, Earnings Management

ABSTRACT

It is expected that accounting earnings is a part of information being applied by the investors to evaluate the risk and returns. It can be predicted that accounting earnings and specifically the difference between the net forecast earnings and actual net earnings has information content during the different periods. Also, price fluctuation and information content of some cases as earnings forecast error are expected. The relation between earnings management and earnings forecast error and economic value added can help the potential investors and other beneficiaries in their decisions about trading or holding the stock. The present study evaluated the significant relation between the earnings management, earnings forecast error and economic value added. To do this, the modified model of Jones- the best model to describe and forecast earnings management was applied. It was found that there is a positive correlation coefficient between earnings management and earnings forecast error and economic value added in the companies listed in Iran capital market with 0.112, 0.134, respectively. There was an inverse relation between independent variable (earnings management) and earnings forecast error and there was a directed relation with economic value added. It means that by the increase of earnings management in a firm, it is possible that earnings and economic value added are decreased and increased, respectively, or vice versa. Generally, there was an inverse relation between earnings management and earnings forecast error and a direct relation with economic value added.

INTRODUCTION

Using earnings as the performance criterion is faced with the supervision from management and this put the earnings validity on pressure. Management supervision is due to his opportunity taking motivation for his own benefits and it is opportunistic manipulation. On the other hand, the supervision of the management has another reason. The access of the managers to confidential information of the company and controlling the future changes cause that by managing the accounting procedure selection implicitly transfer their personal information to other users of accounting reports. This reduces the information asymmetry among the management, stock holders and other beneficiaries and it also increases the value of revenues in terms of relevance. The information asymmetry is the condition in which the managers have more undisclosed information about the various operations of the company in future compared to the investors. This causes that the managers have the motivation for earnings management. Based on the review of literature on earnings management showed that the researchers try to understand why the managers try to manipulate earnings, how earnings is managed and what are the consequences of such behavior. Responding these questions dedicated a major part of empirical studies on accounting and financial reporting. The evaluation of the companies based on accounting figures is one of the important results of publishing accounting figures in the form of financial statements. One of the evaluations is economic value added that is based on theoretical basics consisting of distributed and undistributed earnings, bank interest and tax and depreciation costs. On the other hand, market evaluation of stock companies is not similar with the accounting figures as other items affect the evaluation of the companies other than accounting figures. The closer these two evaluations, the higher the effectiveness of the financial figures. The items affecting the difference of these two items are earnings forecast error and growth opportunities. In other words, the higher the earnings forecast error and growth opportunities, the less the earnings management and the higher the economic value added. The present study evaluated the relation between earnings management and earnings forecast error and economic value added in TSE.

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Statement of the problem:
Decision making is involved in the easiest to the most complex issues of human life. The speed of the development of technology, communication, linking the markets of other countries to each other and the like developed the operational scope and made the economical and investment environments more complex. Thus, economical decision making is turned into an issue that is more problematic and requires the exact information and it is natural that in such competitive environment, economical decisions are mostly based on knowledge and information and they are away from random and illogical aspects. Therefore, most of the economic decisions of the uses are based on financial information and accounting namely the financial statements. Among the users of accounting information, the investors are considered as the most important users. The investors and managers search for a reliant criterion to measure the wealth of stock holders. The criterion assessment by which the investors can judge about the increase and decrease of stock price, creditors about the safety of their capital and the managers about the profitability of their decisions and company profitability [1]. Besides the above mentioned items, there are other factors as helping the investors of capital market of Iran that by better understanding of the relations between earnings management and earnings forecast error and economic value added can invest in the stock in which the maximum return is achieved. This issue developed the capital market and caused the prosperity of economy. These factors necessitated the present study in the present economic condition.

Keywords and acronyms:
Net earnings predicted per share:
It is the earnings indicating the estimation of the management of the future earnings of the company and it is obtained of the total forecasted earnings to the number of stocks [2].

Earnings management:
It is occurred when the managers use their personal judgments in financial reporting and manipulate the trading structure to change the financial reporting. This aim is fulfilled to deviate some earnings owners regarding the economic performance of the company or the effect on the results of the contracts, they conclusion is dependent upon achieving the personal earnings.

Economic Value Added (EVA):
EVA is one of the measurement criteria of performance and it shows the after capital costs earnings residual, (Weighted average cost of capital× Book value of capital) of operation earnings [3].

Study purpose:
The general purpose of this study is the evaluation of the relationship between earnings management and earnings forecast error and EVA in TSE.

Study question:
✓ Is there any significant relationship between earnings management and earnings forecast error?
✓ Is there any significant relationship between earnings management and EVA?

Study hypotheses:
❖ There is a significant relation between earnings management and earnings forecast error.
❖ There is a significant relation between earnings management and EVA.

1- Study model and measuring method of the variables

Study variables:
Table 1: Study variables.
Study variables and their calculation method:

a. The earnings management is calculated as following: Based on the studies, the modified model of Jones is the best model to describe and forecast earnings management. Thus, the present study applied the mentioned model to calculate the discretionary accruals. In the modified model of Jones at first the total accruals were calculated as:

\[
TA_{t,i} = \left( \Delta CA_{t,i} - \Delta CL_{t,i} - \Delta Cash_{t,i} + \Delta STD_{t,i} - DEP_{t,i} \right) / A_{t,i-1}
\]

\( TA_{t,i} \): Total accruals of firm \( i \), year \( t \)
\( \Delta CA_{t,i} \): The change of current assets of firm \( i \), year \( t \), year \( t-1 \)
\( \Delta CL_{t,i} \): The change of the current debts of firm \( i \), year \( t \), year \( t-1 \)
\( \Delta Cash_{t,i} \): The change of the cash flow of firm \( i \), year \( t \), year \( t-1 \)
\( \Delta STD_{t,i} \): The change of current share of long-term debts of firm \( i \), year \( t \), year \( t-1 \)
\( DEP_{t,i} \): The depreciation costs of firm \( i \), year \( t \)
\( A_{t,i-1} \): Total book value of assets of firm \( i \), year \( t-1 \)

After the calculation of total accruals, \( \alpha_1, \alpha_2, \alpha_3 \) parameters are estimated to determine the non-discretionary accruals via the following formula.

\[
NDA_{t,i} = a_0 + a_1 \times \left( \frac{1}{A_{t,i-1}} \right) + a_2 \times \Delta REV_{t,i} + a_3 \times PPE_{t,i} + \epsilon_{i,t}
\]

Where,
\( NDA_{t,i} \): Net discretionary accruals of firm \( i \), year \( t \)
\( \Delta REV_{t,i} \): The change of sale income of firm \( i \), year \( t,t-1 \)
\( PPE_{t,i} \): Gross property, plant and equipment of firm \( i \), year \( t \)
\( A_{t,i-1} \): Total book value of assets of firm \( i \), year \( t-1 \)
\( \epsilon_{i,t} \): Indefinite effects of random factors \( \alpha_1, \alpha_2, \alpha_3 \), via the ordinary least squares, the non-discretionary accruals are determined as following:

b. The forecast error of standardized earnings: It is obtained of the difference between the real earnings minus predicted earnings divided by stock price on the final year of fiscal year [4]. To standardize the earnings forecast error, Roger. G best and Ranold Best (2002) was used. Standardized forecast error

\[
FE = \frac{|YEP_{t-1} - FORE_{t-1}|}{P_{t-1}}
\]

Where
\( t-1 \) indicates the fiscal year before stock earnings declaration.
\( YEP_{t-1} \): Real income of year \( t-1 \)
\( FORE_{t-1} \): Average income forecasting at the end of fiscal year \( t-1 \)
\( P_{t-1} \): Stock price at the end of fiscal year \( t-1 \)

c. Economic value added is calculated as:

1. \( EVA=\text{NOPAT}_{t}-(\text{WACC}_{t} \times \text{Capital}_{t-1}) \)
2. \( EVA=(\text{ROA}_{t} \times \text{Capital}_{t-1})-(\text{WACC}_{t} \times \text{Capital}_{t-1}) \)

EVA: Economic Value Added
Capital: The capital applied
NOPAT: Net operating profit after taxes
WACC: Weighted average cost of capital

Data analysis:

To test the hypotheses of the study, the followings are done:

a. To select the sample companies among the study population by systematic elimination method
b. Obtaining financial statements and other required data of the companies selected and extracting the required data of financial statements of the sample companies.

The calculation of the required variables of the selected companies by Excel software
d. Using Tadbipardaz, Rahavard Novin and Excel software to compute the variables and SPSS software to test the hypotheses and analyses by using study methods as descriptive statistics, correlation (correlation coefficient, the coefficient of determination), regression analysis and coefficients test, correlation analysis and its coefficients and equality test of the significance of some correlation coefficients.

As it was said in the study, to test the hypotheses, correlation coefficient was used and to describe the relation between the study variables to each other, adjusted coefficient of determination was applied. To investigate the explanatory power of the variables, it is presented for total regression model. To determine the probability of using regression line equation and generalizing the results of the sample to the population, significance of correlation coefficient is tested and t-test was used.

If the calculated t is more than the values in the table at confidence interval 95 to 99%, it means that the obtained correlation coefficient is considerable and it is not possible it is arise of random changes and the result is generalized to the population.

**The analysis of the study hypotheses:**

The researcher after the determination and computation of the independent and dependent variables, tested the hypotheses and analyzed them. At first, the correlation relation of the independent variables was tested and then regression method was used to determine the math relation between independent and dependent variables. Indeed, regression analysis helped to find the linear relation between the variables. Finally, to determine the relation between independent and dependent variables, correlation criterion was used. Fortunately, to avoid the calculation of the corresponding statistics of table t, SPSS software calculated the probability and it can be used to support or reject the null hypothesis. The summary of the findings of each hypothesis is as following:

**The study of the normality of the variables:**

As the normality of the dependent variable leads into the normality of model residuals, before model processing, its normality is controlled. Null hypothesis and H1 of normality test are as:

\[
\begin{align*}
H_0 & : \text{The data distribution is normal} \\
H_1 & : \text{The data distribution is not normal}
\end{align*}
\]

To test the above hypothesis, Kolmogorov-Smirnov test was used. In this test, if significance level is less than 5%, null hypothesis is rejected at confidence interval 95%.

**Kolmogorov-Smirnov (K-S):**

To do regression analysis, at first normality test of the variables was investigated by K-S test. H0, H1 of normality test are as following:

\[
\begin{align*}
H_0 & : \text{The data followed normal distribution.} \\
H_1 & : \text{The data didn’t follow normal distribution.}
\end{align*}
\]

As significance level in the variables was greater than 0.05, H0 is supported and H1 is rejected. In other words, the data had normal distribution. Thus, the normality hypothesis of the variables of the study was supported.

**Test hypothesis:**

Hypothesis 1: There was a significant relation between earnings management and earnings forecast error.
Hypothesis 2: There is a significant relation between earnings management and EVA.

H0, H1 are defined as:

\[
\begin{align*}
H_0: & \ \rho = 0 \\
H_1: & \ \rho \neq 0
\end{align*}
\]

To test the hypothesis by this index, the test result has four outputs.

First output: The entered independent variables investigated the eliminated variables and the method in determining the regression.

Enter method is an approach in selection of the variables in which all the entered variables are used in determining the regression in one stage.

Second output: Correlation coefficient investigated the coefficient of determination and Durbin-Watson test between the independent and dependent variables. In this output correlation coefficient between earnings management as independent variable and earnings forecast error and EVA as dependent variable was 0.112, 0.134, respectively. The coefficient of determination (the change in dependent variable that can be explained by regression) presents the adjusted coefficient of determination and estimation criterion error. Durbin-Watson test
statistics was 1.567, 1.830, respectively being in the range 1.5 to 2.5. The non-autocorrelation assumption between the errors is not rejected and the regression is used.

Third output: It is consisting of regression variance analysis to investigate the absoluteness of the linear relation between the variables.

The study hypotheses of significance test of total regression model are as:

H₀: There is no linear relation between two variables
H₁: There is a linear relation between two variables

In this output, significance level was less than 5% and linearity assumption supported the relation of two variables. The results of this output are F=9.948, F=9.764 and significance level was 0.002, 0.003, respectively and less than 0.05. Thus, at level α=0.05, there was a significant relation between dependent variable (earnings forecast error and EVA) and independent variable (earnings management). F statistics is obtained of dividing the mean of regression squares by the mean of residuals squares. F statistics showed the significance of regression at confidence interval 95%. Thus, H₀ is rejected and the significant relation between earnings management and earnings forecast error and EVA is supported.

Fourth output: The regression equation coefficients of dependent variable of the tests of each of the regression coefficients, one of the real tests of the hypotheses about the model parameters were used to measure the regression model. To investigate the significance of the independent variables, t-statistics was used. T-statistics for the variable (earnings management) was significant at confidence interval 95%. Variance Inflation Factor (VIF) of all the values was less than 5 and it showed the non-linearity between the independent variables. Coefficients (B) are the constant value and independent variables coefficient in regression equation and the regression equation is as:

a) \( \text{FE}= -2.516 - 404 \text{ DA} \)
b) \( \text{EVA}= 9.260 + .505 \text{ DA} \)

Based on t-statistics, there was an inverse relation between earnings management and earnings forecast error and there was a direct relation with EVA. The more the earnings management, the less the earnings forecast error and the more EVA and vice versa.

Chart 1: Histogram of regression standardized residuals with dependent variable of earnings forecast error.

Chart 2: Histogram of regression standardized residuals with dependent variable of EVA.

Based on charts 1, 2, the present mean in the right side (close to 0) and standard deviation was close to 1. The standardized residuals were normal.
Conclusion:

The result of first hypothesis test:

There is a significant relation between earnings management and earnings forecast error. There was a positive correlation coefficient between earnings management and earnings forecast error in the companies listed in Iran capital market and it is equal to 0.112. F-statistics is 9.948 and significance 0.002 showed the significance of the regression at confidence interval 95%. Thus, H0 is rejected and the relation between earnings management and earnings forecast error is supported. T-statistics values showed the significance of earnings management coefficient. There was an inverse relation between independent variable (earnings management) and earnings forecast error based on t-statistics. It means that by the increase of earnings management in a company, it is probable that the earnings forecast error is reduced and if the earnings management is reduced, the earnings forecast error is increased. The investigations showed that the above hypothesis is supported and there is a linear and negative relation between earnings management and earnings forecast error.

The result of second hypothesis test:

There is a significant relation between earnings management and EVA. Based on the tests and analysis of regression and correlation, it can be said that there was a positive correlation coefficient between earnings management and EVA in the companies listed in Iran capital market and it is equal to 0.134. F-statistics is 8.764 and significance 0.000 showed the significance of the regression at confidence interval 95%. Thus, H0 is rejected and the relation between earnings management and EVA is supported. T-statistics values showed the significance of earnings management coefficient. There was a direct relation between independent variable (earnings management) and EVA based on t-statistics. It means that by the increase of earnings management in a company, it is probable that the EVA is increased and if the earnings management is reduced, the EVA is reduced. The investigations showed that the above hypothesis is supported and there is a linear and positive relation between earnings management and EVA.

The general evaluation of the results of hypothesis test:
The earnings management had inverse relation with earnings forecast error but it had direct relation with EVA.

**Some recommendations based on the results of the study:**

The recommendation based on the results of hypothesis 1: Based on the results of the first hypothesis on “There is a significant relation between earnings management and earnings forecast error” and it was supported. It is recommended to the stock holders and other investors take decisions about achieving high returns about the companies with more earnings management and low earnings forecast error and the companies in which earnings management is low and earnings forecast error is high.

The recommendation of the results of second hypothesis: Based on the results of second hypothesis on “There is a significant relation between earnings management and EVA” that is supported. It is recommended to the stock holders and other investors take decisions about achieving high EVA based on the increase and decrease of the management about the companies with more earnings management and high EVA and the companies in which earnings management is low, EVA is low.

**REFERENCES**


