The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent  
(Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)

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Abstract. This study aims to determine the effect of earnings management on investment efficiency and determine the effect of company size on the relationship between earnings management and investment efficiency, (group of companies overinvestment and underinvestment). This research is a quantitative study using descriptive statistical analysis methods and Moderated Regression Analysis (MRA).

The data used are financial data of companies listed on the IDN instead of the financial industry. The results showed that earnings management had affected the efficiency of investment both overinvestment and underinvestment companies. Despite of that, it has figured out that company size is a mediator variable which means that company size influences the relationship between earnings management and investment efficiency. The strength of the relationship between earnings management and investment efficiency is determined by the size of the company.

Keywords: Earnings Management, Investment Efficiency, Company Size

INTRODUCTION

Background

Investment is an activity performed by a company allocating its resources which is its own capital to reach the company’s goal to get optimal earnings. The better the company capability is, the better earnings will be guaranteed.

Earning is one of the indicators measuring the company performance. A company is in a good condition if it can optimize its earnings. Financial management of a company should have to be managed well to reach the company’s achievement. Result of financial management of a company is described on the information of finance report.

However, financial information report of a company is not always complying with the real condition. Financial information particulary related to earnings is vulnerable to manipulation. This manipulation is done by the management (agent) to satisfy the owner (principal) about company financial performance. It has happened due to conflict of interest between the agent and the principal. The management effort to manipulate earning information is earnings management. Such the condition has affected the inefficient investment efforts done by the company. Therefore, it will not provide any profit to the company. The research of Biddie (2009) and Argento (2016) described that the quality of financial report had negative correlation with investment efficiency either
overinvestment company or underinvestment one. It has identified that the better the quality of financial report, the more efficient investment will be.

Investment efforts that can provide earnings for the company are figured out by positive Net Present Value of the company. However, since earnings management has been performed, this condition cannot be achieved by the company. And this inefficient investment condition is described as overinvestment and underinvestment company.

Problems

The problems of this research are as the following:
1. Is earnings management affecting the investment efficiency (overinvestment and underinvestment category)?
2. Is the size of company affecting the relationship between earnings management and investment efficiency (overinvestment and underinvestment category)?

THEORETICAL REVIEW

Agency Theory

Jensen and Meckling (1976) described that relationship between agency and company management(agent) with the principal had happened. Shareholders have authorized the company management to run business of the company, including the authority to make a decision on behalf of shareholders. Company management is obliged to increase the company value to maximize shareholders well-being.

Relationship between principal and agent can direct to asymmetrical information because the agent is having more information about the company than the principal. With the assumption that people have been maximizing their need, therefore by having asymmetrical information, it will direct the agent to hide some information from the principal.

Quality of Financial Report

Main goal of financial report according to PSAK No.1 paragraph 05 is to provide the information about the financial condition, performance and cash flow of the company for the benefit of financial report users in order to make any economical decision and to show management responsibility about using the resources which are trusted to them.

Earning management

According to Schipper (1989) mentioned in Subramanyan and Wild (2010), earnings management is the management intervention which is the efforts to meet their requirement on purpose. Healy and Wahlen (1999) defined that earnings management is happened when the management has used the issues of consideration to jeopardize financial report, so that it can misinterpret the shareholder perception about the financial report or influence the earnings contracts which have been stated based on the figures on the financial report.

Investation

Basalamah and Haming (2010) described that investment is a decision to use the money to purchase tangible assets (land, house, car, etc) or financial assets (shares, obligations, reksadana (mutual fund), money order, etc) in order to receive bigger earnings in the future.

Investment Efficiency

According to Hodgson et al (2000) investment efficiency is the function of risk, return and total cost of the investment management structure which is depending on the
extent to which the investors have been doing. A company is investing efficiently if it has taken the projects having positive net present value (NPV) with the condition when there is not any market friction such as adverse selection or agency costs (Biddle et al. 2009)

Investment of a company is efficient if there is not any underinvestment or overinvestment happened. Underinvestment is defined as an investment opportunity which will produce positive NPV, and overinvestment is defined as an investment that will be done in a project having negative NPV (Biddle et al. 2009)

**Company Size**

According to Bringham and Houston (2006) described that the size of a company is the average of total net. And the sales revenue received during the related year up to several years. In this case, sales revenue is bigger than variables cost and fixed cost, so that, it will gain total of the earnings before tax. But, on the contrary, if sales revenue is smaller than variable cost and fixed cost, the company will be suffering from loss.

Size of the company is a scale to classify the extent to which company is big or small based on varied ways which is size of companies categorized into 3 categories; large firm, medium firm and small firm.

**Hypotheses Development**

The hypotheses offered are as follows:

**H1:** Earnings management has affected the investment efficiency (category of overinvestment and underinvestment).

**H2:** Size of companies has affected the relationship between earnings management and investment efficiency (category of overinvestment and underinvestment)

**RESEARCH METODOLOGY**

**Research Method**

This research has applied casual associative method. There are three variables; earning management variable as independent variable; investment efficiency variables as dependent variables which have been divided into two company categories, overinvestment category and underinvestment category; and moderated size of companies variable.

**Research Design and Reseach Model**

This research design is described as follows:

\[
\begin{align*}
Y_{over} & = \beta_0 + \beta_1 X_1 + \varepsilon_i \\
Y_{under} & = \beta_0 + \beta_1 X_1 + \varepsilon_i \\
Y_{over} & = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 \times X_2 + \varepsilon_i \\
Y_{under} & = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 \times X_2 + \varepsilon_i
\end{align*}
\]

**Figure 1. Research Design**

In order to test the hypotheses, it has used regression equation model as follows:

**Syarief Gerald Prasetya.** The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent (Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)
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Resource: data processed

25% companies are having investment efficiency of less than -0.0566 and 75% companies are having investment efficiency of less than 0.0305. Having had median value of -0.253, it has identified that mostly the companies listed on BEI(Indonesia Stock Exchange) are having negative efficiency value (including underinvestment category) However, 62 companies or 62.00 % are within underinvestment category and the rest of 38 companies or 38% are within overinvesed category. The average value of investment efficiency of the companies which are within overinvested is 0.0960 and underinvestment category is -0.0480 on average.

Furthermore, 25% companies has applied earnings management by decreasing their earnings value. It has described the value of earnings management of 25% which is -0.441, and 75% companies has increased the earnings value of 0.0796. Having had
The median value of 0.0184, the related data has identified that mostly the companies listed on BEI have performed earnings management by increasing their earnings value.

**Normality Test**

Result of normality test has been described on the following tables:

<table>
<thead>
<tr>
<th></th>
<th>Positive</th>
<th>Negative</th>
<th>K-S Z</th>
<th>2 tailed p.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation (3)</td>
<td>0.098</td>
<td>-0.098</td>
<td>0.946</td>
<td>0.176</td>
</tr>
<tr>
<td>Equation (4)</td>
<td>0.057</td>
<td>-0.057</td>
<td>1.001</td>
<td>0.269</td>
</tr>
</tbody>
</table>

Result of normality test analysis has indicated p-value residual which is more than 0.05, it is determined that the model is distributed normally and regression using Multiple Linear Regression Model can be performed.

**Multicollinearity Test**

Result of Multicollinearity test is described on the table herebelow:

<table>
<thead>
<tr>
<th>Category</th>
<th>Variable</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overinvestment</td>
<td>Earnings management ($X_1$)</td>
<td>0.720</td>
<td>1.389</td>
</tr>
<tr>
<td></td>
<td>Company Size ($X_2$)</td>
<td>0.860</td>
<td>1.162</td>
</tr>
<tr>
<td></td>
<td>Moderate ($X_1 * X_2$)</td>
<td>0.641</td>
<td>1.560</td>
</tr>
<tr>
<td>Underinvestment</td>
<td>Earnings management ($X_1$)</td>
<td>0.838</td>
<td>1.193</td>
</tr>
<tr>
<td></td>
<td>Company Size ($X_2$)</td>
<td>0.808</td>
<td>1.238</td>
</tr>
<tr>
<td></td>
<td>Moderate ($X_1 * X_2$)</td>
<td>0.690</td>
<td>1.450</td>
</tr>
</tbody>
</table>

Result analysis has indicated that both company categories have had tolerance value of each variable which is more than 0.1 and VIF value which is less than 10. It has determined that multicollinearity is happened.

**Heteroscedasticity Test**

Result of Heteroscedasticity test is described on the following table:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Equation (3)</th>
<th>Equation (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings management ($X_1$)</td>
<td>0.207</td>
<td>0.602</td>
</tr>
<tr>
<td>Company Size ($X_2$)</td>
<td>0.117</td>
<td>0.942</td>
</tr>
<tr>
<td>Moderate ($X_1 * X_2$)</td>
<td>0.315</td>
<td>0.251</td>
</tr>
</tbody>
</table>

Result of heteroscedasticity test has indicated that p-value(sig.) of all equations is more than 0.05, it is determined that heteroscedasticity is not happened between earnings management, company size and moderated one against residual absolute of each equation (overinvestment and underinvestment category)
Autocorrelation Test

Result of Autocorrelation Test is described on the following table:

Table 5. Autocorrelation Test

<table>
<thead>
<tr>
<th>Equation</th>
<th>dl</th>
<th>du</th>
<th>4 - DW</th>
<th>DW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation (3)</td>
<td>1,675</td>
<td>1,851</td>
<td>2,063</td>
<td>1,937</td>
</tr>
<tr>
<td>Equation (4)</td>
<td>1,686</td>
<td>1,852</td>
<td>2,101</td>
<td>1,899</td>
</tr>
</tbody>
</table>

Resource: data processed

It has described dw value of each equation is bigger than du value but less than 4DW value, it is concluded that there is not any either positive of negative autocorrelation occurred on each equation (overinvestment and underinvestment category)

Test Result of Hypothesis 1 Model

According to the analysis result, determinant coefficient value is described on the following table:

Table 6. Recapitulation of Test Result of Goodness Fit of Earnings Management Upon Investment Efficiency

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation (1) / Overinvestment</td>
<td>0,270</td>
<td>0,073</td>
<td>0,068</td>
<td>0,114</td>
</tr>
<tr>
<td>Equation (2) / Underinvestment</td>
<td>0,262</td>
<td>0,069</td>
<td>0,066</td>
<td>0,022</td>
</tr>
</tbody>
</table>

Resource : Data processed

Result of the Analysis has indicated the value of Adjusted R Square of overinvestment companies of 0.068 interpreting the contribution of earnings management upon investment efficiency is 6.80 %.

And the value of Adjusted R Square of underinvestment indicated 0.066 interpreting that the contribution of earnings management upon investment efficiency is 6.60%.

Then, in order to test significance effect of earnings management upon investment efficiency partially, it has applied t-test. Result of analysis applying simple regression has indicated on the following table:

Table 7. Recapitulation of Simple Regression Result of the Effect of Earnings Management upon Investment Efficiency (Overinvestment)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>0,088</td>
<td>0,009</td>
<td></td>
<td>10,283</td>
</tr>
<tr>
<td>Earnings management</td>
<td>0,168</td>
<td>0,044</td>
<td>0,270</td>
<td>3,849</td>
</tr>
</tbody>
</table>

Resource : data processed
Result of the research has produced t-count value of earnings management ($X_1$) of overinvestment category of 3.849 and sig.probability of 0.000. As significant probability is smaller than 0.05, so that, earnings management of overinvestment category has affected significantly investment efficiency.

However, underinvestment category has produced t-count of earnings management ($X_1$) of -4.773 and sig.probability of 0.000. As sig.probability is smaller than 0.05, nevertheless, earnings management of underinvestment category has affected significantly investment efficiency. Result of the analysis is described on the following table:

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-0.048</td>
<td>0.001</td>
<td>-7.099</td>
<td>0.000</td>
</tr>
<tr>
<td>Earnings management</td>
<td>-0.056</td>
<td>0.012</td>
<td>-4.773</td>
<td>0.000</td>
</tr>
</tbody>
</table>

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However, underinvestment category has produced t-count of earnings management ($X_1$) of -4.773 and sig.probability of 0.000. As sig.probability is smaller than 0.05, nevertheless, earnings management of underinvestment category has affected significantly investment efficiency. Result of the analysis is described on the following table:

<table>
<thead>
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<th>Model</th>
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<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-0.048</td>
<td>0.001</td>
<td>-7.099</td>
<td>0.000</td>
</tr>
<tr>
<td>Earnings management</td>
<td>-0.056</td>
<td>0.012</td>
<td>-4.773</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on the result above, earnings management of both overinvestment and underinvestment has affected investment efficiency. Therefore, the hypothesis describing that earnings management has affected investment efficiency either overinvestment and underinvestment is accepted.

Result of Model Test of Hypothesis 2

Analysis result has produced determinant coefficient value as the following table:

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation (3) / Overinvestment</td>
<td>0.328</td>
<td>0.107</td>
<td>0.093</td>
<td>0.113</td>
</tr>
<tr>
<td>Equation (4) / Underinvestment</td>
<td>0.289</td>
<td>0.083</td>
<td>0.074</td>
<td>0.023</td>
</tr>
</tbody>
</table>

Result of analysis has indicated Adjusted R Square value of overinvestment category of 0.093 which is interpreting the extent to which earnings management, size of the company and moderated size of the company has contributed investment efficiency which is 9.30%.

Further more, Adjusted R Square value of underinvestment category of 0.074 interpreting the extent to which earnings management, size of the company and moderated size of company has contributed investment efficiency which is 7.40%.

Moreover, in order to test the significance of the effect of earnings management, size of the company and moderated size of the company simultaneously upon investment efficiency, it has applied F-test. T-test applying multiple regression has indicated on the following table:
The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent (Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)

Table 1.
Recapitulation of F-test Result of the Effect of Earnings Management, Size of the company and Moderate Size of the Company upon Investment Efficiency

<table>
<thead>
<tr>
<th>Model</th>
<th>F-hitung</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equation (3) / Overinvestment</td>
<td>7,460</td>
<td>0,000</td>
</tr>
<tr>
<td>Equation (4) / Underinvestment</td>
<td>9,272</td>
<td>0,000</td>
</tr>
</tbody>
</table>

Result of analysis has produced Equation (3) F-count value of 7.460 and sig.probability value of 0.000, but equation (4) underinvestment category has produced F-count of 9.272 and sig.probability value of 0.000.

Due to significance probability value of both company categories is bigger than 0.05, the regression model is applicable to predict the investment efficiency, or in other words, earnings management, size of the company and moderated size of the company simultaneously have affected significantly investment efficiency either for the category of overinvestment of underinvestment. Further more, in order to test the effect of size of the company upon earnings management and investment efficiency of overinvestment, t-test is applied and the result is indicated as follows:

Table 2.
Recapitulation of the result of Moderated Regression Analysis (MRA) about the Effect of Earnings Management, Size of the Company and Moderated Size of the company upon the Investment Efficiency (Overinvestment)

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B Std. Error Beta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>0.085 0.009</td>
<td>9.002</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Earnings management</td>
<td>0.104 0.051 0.168</td>
<td>2.061</td>
<td>0.041</td>
</tr>
<tr>
<td></td>
<td>Size of the company</td>
<td>2.7E-013 0.000 0.028</td>
<td>0.370</td>
<td>0.712</td>
</tr>
<tr>
<td></td>
<td>Moderated</td>
<td>1,2E-011 0.000 0.201</td>
<td>2.320</td>
<td>0.021</td>
</tr>
</tbody>
</table>

Referring to the three variables which have been input into moderated regression model, they have indicated that earnings management is having t-count value of 2.061 and sig.probability value of 0.000. Size of the company has indicated t-count value of 0.370 and sig.probability value of 0.712 and moderated size of the company is indicated t-count value of 2.320 and sig.probability value of 0.021. Since significant probability value of moderated size of the company (X1*X2)is smaller than 0.05, however, size of the company is moderating value which is the variable affecting the relationship between earnings management and investment efficiency.

Interaction between earnings management and size of the company is indicated by the increasing determinant coefficient value ($R^2$). Equation (1) determinant coefficient value of overinvestment is 0.068, and equation (3) after having had size of company, determinant coefficient value is 0.093. Therefore, having had increasing determinant coefficient value which is bigger then 0 (nul), it is indicating that earnings management and size of the company have been re-interacting to affect investment efficiency.

Furthermore, in order to see the test result of the effect of size of the company upon the relationship between earnings management and investment efficiency of underinvestment category, it is described on the following table:
Syarief Gerald Prasetya. The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent (Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)
Syarief Gerald Prasetya. The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent. (Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)

REFERENCE


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Messod, D, Beneish, Charles M.C. Lee, and D. Craig Nichols. 2013 Earnings Manipulation and Expected Returns.


Syarief Gerald Prasetya. The effect of earnings management upon the investment efficiency using the company size as the variable of moderated agent (Empirics study at the companies registered at the Indonesia stock exchange 2014 – 2018)