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Analysis The Effect of Financial Ratios in Predicting Changes in Profit

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ABSTRACT: *Textile companies is one of the major types of industries in Indonesia whose development is prioritized to make a significant contribution to the national economy. This study aims to analyzed the effect of financial ratios on earnings changes by estimated parameters using panel data regression analysis. In panel data regression, there are three estimation models, namely CEM, FEM, and REM. These three models will be selected the bes model using Chow Test and Haussman Test. The result of this study, best panel data regression model is using Fixed Effect Model (FEM) with individual effect. Variables that have a significant effect on earnings changes are Return on Equity, Return on Asset, Net Profit Margin.*
Keywords: *Data Panel Regression, Financial ratio, Profit.*

I. INTRODUCTION

Textile is an important economic sector in meeting domestic needs in Indonesia. Economic developments in the textile world have an impact on the high competition in the business world so as to encourage business people with an interest in the development of a company to find out the position and financial condition of the company. The parties concerned to know the financial condition of a company are internal parties and external parties. Both have the same interests to find out information relating to the company.The media that is usually used to describe the condition and financial performance of a company is financial statements. From these financial statements, further research can be done called financial statement analysis to find out whether the company is in good condition, one of the analyzes that can be used is ratio analysis. The main focus of financial statements is earnings, this is stated by the Financial Accounting Standards Board - FASB (1978), Statement of Financial Accounting Concepts No.1, so financial statement information should have the ability to predict future earnings as a measure of company performance. The company's ability to achieve profits in the future is an indication of the company's performance and prospects. Based on the description above, the researcher is interested in conducting research with the title, "Analysis of the Effect of Financial Ratios in Predicting Profit Changes" using the panel data regression estimation method with 7 financial ratios as the independent variable.

II. RESEARCH METHODS

A. Object of research

The object in this study is the financial ratios in nine textile companies in Indonesia in the period 2014-2018, which includes TAT, FAT, ROS, ROE, ROA, GPM, NPM. This study uses financial ratios and earnings changes as independent and non-independent variables as follows:

Table 4.1 Research Variable

Variable	Symbol
Total Asset Turnover	X_1
Fixed Asset Turnover	X_2
Return on Sales	X_3
Return on Equity	X_4
Return on Asset	X_5
Gross Profit Margin	X_6
Net Profit Margin	X_7
Change in profit	Y

B. Data Panel Regression

Panel Data is data that is the result of observations on several individuals or (cross-section units) which are each observed in several consecutive time periods (unit time) (Baltagi, 2005). The panel regression model that is only affected by one unit (unit cross-section and time series) is called the one-way component model, while the panel regression model that is affected by both units (cross-section and time series units) is called the two-way component model. In general, there are two approaches used in estimating models from panel data that are without individual influence (Common Effect Model) and models with individual influence (Fixed Effect Model and Random Effect Model).

C. Parameter Estimation in Panel Data Regression

In estimating the parameters, several methods are needed to estimate the parameters such as the Common Effect Model (CEM) approach, Fixed Effect Model (FEM), and Random Effect Model (REM).

1. Common Effect Model (CEM)

This method is the simplest method in estimating the panel data regression model because we combine data regardless of the time and place of research. CEM assumes that the intercept and slope in the cross section and time series units are the same. In the CEM approach with n explanatory variables can be written as follows (Dody Apriliawan, et al., 2013

$$y_{it} = \beta + \beta' x_{nit} + \varepsilon_{it} \quad (1)$$

2. Fixed Effect Model (FEM)

This model assumes that intercepts are different for each cross-section or time series with a slope that is constant (unchanging). Models that assume intercepts are different for each cross-section but the slope does not change every time are called individual effect models. While the model that assumes different intercepts for each time series but the slope does not change every individual is called the time effect model. Estimation of panel regression parameters with the Fixed Effect Model uses the technique of adding dummy variables so that this method is often called the Least Square Dummy Variable model, so that the general equation can be formed as follows (William H Greene, 1990):

$$y_{it} = \beta_i D + \beta' x_{it} + \varepsilon_{it} \quad (2)$$

3. Random Effect Model (REM)

Random Effect Model (REM) estimates panel data where interference variables may be interconnected between time and between individuals. The estimation of this model is assumed that each individual effect is random for all cross-section units. The REM regression equation is as follows (William H Greene, 1990):

$$y_{it} = \beta_i + \beta' x_{it} + \varepsilon_{it} \quad (3)$$

D. Selection of Panel Data Regression Estimation Model

1. Chow Test

The chow test is used to select one model in panel data regression, which is between the Common Effect Model (CEM) or the Fixed Effect Model (FEM). The hypothesis in the chow test is as follows:

H_0 : *Common Effect Model* (CEM)

H_1 : *Fixed Effect Model* (FEM)

Reject H_0 if $F_{count} > F_{table}$ or $p - value < \propto$

2. Haussman Test

Hausman test is used to select one of the models in panel data regression, which is between random effect model (REM) or fixed effect model (FEM).

The hypothesis in the chow test is as follows:

H_0 : *Random Effect Model* (REM)

H_1 : *Fixed Effect Model* (FEM)

Reject H_0 if $w > \chi^2$ or $p - value < \propto$

E. *Coefficient of Determination*

The coefficient of determination (R^2) aims to measure how much the variation of the dependent variable Y can be explained by the independent variable X. If the value of the coefficient of determination is equal to 0 (R^2= 0), it means that the variation of Y cannot be explained by at all X In other words R^2= 1, meaning that the variation of Y as a whole can be explained by X. The value of R^2ranges between zero and one.

$$R^2 = \frac{\sum_{i=1}^{n}(\hat{Y}_i - \bar{Y})^2}{\sum_{i=1}^{n}(Y_i - \bar{Y})^2} \quad (4)$$

F Testing Parameters

1. F test

In general, hypothesis testing is as follows:

H_0 There is no influence of the independent variable and the dependent variable

H_1 :there is the effect of the independent variable and the dependent variable

$$F = \frac{R^2/(N+K-1)}{(1-R^2)/(NT-N-K)} \quad (5)$$

Where:

R^2: coefficient of determination

N: the number of cross section units

Q: The number of time series units

K: number of independent variables

If the value of $F_{hitung} > F_{tabel} = F_{\alpha;(k;NT-k-1)}$ then H_0 is rejected, meaning that there is an influence between the independent variable and the dependent variable.

2. T test

In general, hypothesis testing is as follows:

H_0 : There is no significant influence of the independent variable and the dependent variable

H_1 : there is a significant influence of the independent variable and the dependent variable

$$t_{count} = \frac{\beta_j}{se(\beta_j)} \quad (6)$$

j: 1,2,3, ..., n

t: value of t_{count}

β_j : regression coefficient

se (β_j): standard error / standard error of the regression coefficient

If $|t_{hitung}| > t_{tabel} = t_{\left(\frac{\alpha}{2},NT-k-1\right)}$ then reject H_0, which means there is a significant influence between the independent variables on the dependent variable.

III. RESULT AND DISCUSSION

3.1 Panel Data Regression Estimation

1. Common Effect Model

Tabel 3.1 Estimation of Parameterss in CEM

Variable	Coefficient
C	0,126
X_1	-1,6024
X_2	-0,3745
X_3	-50,4983
X_4	-19,505
X_5	-18,12893
X_6	28,24999
X_7	69,13043

Based on the calculation above, the CEM model is obtained as follows:

$$Y_{it} = 0.126 + (-1.6024)X_1 + (-0.37450)X_2 + (-50.4983)X_3 + (-19.505)X_4 + (-18.128938)X_5 + (28.24999)X_6 + (69.13043)X_7$$

Based on the model obtained, it can be concluded that if the variable has a negative coefficient, this means that each addition of 1 unit to the variable, the value of earnings changes will decrease by the coefficient of the variable. As for the other variables, the coefficient value is positive, meaning that each addition to each variable, the change in earnings will increase by each coefficient.

2. Fixed Effect Model

a. Individual Effect Model

In the individual effects model, what counts is the effect of cross-section or individual units.

Table 3.2 Estimation of Parameterss in FEM (individual effect models)

Variable	Coefficient
X_1	-4,95844690
X_2	1,146829215
X_3	-4,1682921
X_4	-15,8566217
X_5	-65,3674500
X_6	31,32614098
X_7	68,2909027

Then the intercept value of each company is:

Table 3.3 Intercept values of each company

Variable	Coefficient
D_1	-2,877
D_2	-2,994
D_3	-2,888
D_4	0,476
D_5	1,822
D_6	14,742
D_7	-0,328
D_8	2,542
D_9	0,201

Based on table 3.2 and table 3.3, the FEM model obtained with individual effects is :

$$Y_{it} = -54{,}378D_{1t} - 17{,}084D_{2t} - 83{,}669D_{3t} - 18{,}775D_{4t} - 27{,}780D_{5t} + 53{,}726D_{6t} - 24{,}643D_{7t} - 32{,}236D_{8t} - 41{,}947D_{9t} - 4.95844690X_1 + (1.146829215)X_2 + (-4.1682921)X_3 + (-15.8566217)X_4 + (-65.3674500)X_5 + 31.3261409X_6 + (68.2909027)X_7$$

Based on the model obtained, it can be concluded that if the variable has a negative coefficient, this means that each addition of 1 unit to the variable, the value of earnings changes will decrease by the coefficient of the variable. As for the other variables, the coefficient value is positive, meaning that each addition to each variable, the change in earnings will increase by each coefficient.

b. Time Series Effect Model

In the individual effects model, what is taken into account is the influence of time series units, in this case the effect of the 2014-2018 time span on profit changes.

Table 3.4 Estimation of Parameterss in FEM (Time Series Effect models)

Variable	Coefficient
X_1	-1,75385242
X_2	-0.33590736
X_3	-50,7177692
X_4	-19,1968462
X_5	-14,5885897
X_6	25,95026395
X_7	68,49269570

Then the intercept value of each time is

Table 3.5 Intercept value for each time

Variable	Coefficient
D_1(in 2018)	-0,00188
D_2 (in 2017)	0,178072
D_3 (in 2016)	0,764538
D_4 (in 2015)	-0,61025
D_5(in 2014)	1,523142

Based on table 3.4 and table 3.5, the FEM model with individual effects is obtained :

$$Y_{it} = -0{,}00188D_{i1} + 0{,}178072D_{i2} + 0{,}764538D_{i3} - 0{,}61025D_{i4} + 1{,}523142D_{i5} - 1.75385242X_1 + (-0.335907360)X_2 + (-50.7177692)X_3 + (-19.19684628)X_4 + (-14.5885894)X_5 + 25.95026395X_6 + (68.49269570)X_7$$

Based on the model obtained, it can be concluded that if the variable has a negative coefficient, this means that each addition of 1 unit to the variable, the value of earnings changes will decrease by the coefficient of the variable. As for the other variables, the coefficient value is positive, meaning that each addition to each variable, the change in earnings will increase by each coefficient.

3. Random Effect Model

Table 3.6 Estimation of Parameters in REM

Variable	Coefficient
C	-1.5226148
X_1	-0.50194196
X_2	-0.2364186
X_3	-74.1163815
X_4	-20.615600
X_5	2.63007417
X_6	31.6312365
X_7	79.3394245

Based on table 3.6, the REM model is:

$$Y_{it} = -1.5226148 + (-0.50194196)X_1 + (-0.2364186)X_2 + (-74.1163815)X_3 + (-20.615600)X_4 + 2.63007417X_5 + 31.6312365X_6 + 79.3394245X_7$$

Based on the model obtained, it can be concluded that if the variable has a negative coefficient, this means that each addition of 1 unit to the variable, the value of earnings changes will decrease by the coefficient of the variable. As for the other variables, the coefficient value is positive, meaning that each addition to each variable, the change in earnings will increase by each coefficient.

3.2 Selection of the Best Panel Data Regression Model

1. Chow Test

Table 3.7 Chow Test

Effect Test	*Statistic*	*p-value*
Cros-section Chi Square	18,203811	0,0197

Based on table 4.12, the p-value is less than the significance level (0.05), so reject H0. This means that the better model to use is FEM. Next choose between FEM and REM with haussman test.

2. Haussman Test

Table 3.8 Haussman Test

Test Summary	*Statistic*	*p-value*
Cros-section random	14,288458	0,0463

Based on Table 4.13the p-value obtained at random cross-section is 0.0463 where the p-value is smaller than the significance level (0.05) so that H0 is rejected. Then the better model to use is FEM.

3.3 Coefficient Determination

To find out which model is better in fixed effect panel data can be seen from the coefficient of determination (R^2)as follows:

Table 3.9 Coefficient Determination of FEM (individual effect)

Coefficient Determination	Coefficient value
R^2	0,700789

Table 3.10 Coefficient Determination of FEM (time series effects)

Koefisien Determinasi	Nilai Koefisien
R^2	0,586008

Because the coefficient of determination in the individual effect model is greater than the time effect model, a better model is the individual effect model.

3.4 Parameters Testing

1. F-test

F count
4,5281

Based on the above results, the f_{count} is 4.5281where $F_{\alpha;(k;N-k-1)} = F_{0,05;(7;37)} = 2,27$ so $f_{count} > f_{tabel}$ thenreject H_0. This means that the independent variables together have a significant effect on the dependent variable.

2. T-test

Table 3.11 The value of t_{count} on FEM estimation with individual effect model

Variables	Coefficient
C	0.002314
X_1	0.380693
X_2	0.749282
X_3	0.172579
X_4	3.668516
X_5	3.036352
X_6	1.497004
X_7	2.538770

Based on Table 4.10, variables X_1, X_2, X_3,dan X_6 have $t_{count} < t_{table} = t_{(0.025,45-7-1)} = 2.02619$so variables X_1, X_2, X_3, and X_6 have no significant effect on variable Y. Conversely the variables X_4, X_5, dan X_7 have $t_{count} > t_{table} = t_{(0.025,45-7-1)} = 2.02619$then the variables X_4, X_5, dan X_7 significantly influence the variable Y.

IV. CONCLUSION

Based on research results using panel data regression analysis, the following conclusions are obtained:

The best model of this case is the Fixed Effect Model with an individual effect model where if TAT has increased by 1 value, there will be a decrease in profit changes of 4.9584469. If FAT has increased by 1 value, there will be an increase in profit change of 1.146829215. If the ROS has increased by 1 value, there will be a decrease in profit changes of 4.1682921. If ROE has increased by 1 value, there will be a decrease in profit changes of 15.8566217. If ROA has increased by 1 value, the profit change will decrease by 65.3674500. If GPM has increased by 1 value, there will be an increase in profit change of 31.3261409. If GPM has increased by 1 value, there will be an increasein profit changes of 68.2909027. The independent variables jointly influence the dependent variable and the variables X_1, X_2, X_3, and X_6 do not significantly influence the Y variable. Instead the variables X_4, X_5, and X_7 significantly influence the Y variable

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