International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 12, Issue 8, 2020

Effects of Earning Manipulation, Strength of Financial Position and Financial Distress on Firm Value (Case of Listed Manufacturing Firms in Indonesia)

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Financial accounting information is often used by researchers and investors to measures firms value. The objective of this research is to investigate whether earning manipulation, strength of financial position and financial distress effect firm value. In this research earning manipulation is measured using Beneish M-Score, strength of financial position is measured using Piotroski F - Score, Financial distress measured using Altmann Z-score, and firm value is measured using Price Book Value (PBV). We used 125 observations from publicly listed manufacturing companies in Indonesia Stock Exchange (Bursa Efek Indonesia) in 2014, 2015, and 2016. Our research uses panel data analysis, and as the hypothesis test using E-VIEW. Results of our research show that only financial distress influences firm value. However, all independent variables simultaneously influence firm value. This finding also indicates that financial distress is more important than the other earning manipulation and strength of financial position in determining firm value.

Key words: *Beneish M-Score, Piotroski F-Score, Altmann Z-score, Firm Value.*

Introduction

Investors keep looking for firms with more favourable performance. Thus, identification of these kind of firms have been a never ending quest for many parties. Accounting based fundamental analysis has been used by male academicians, investors and alto researchers to identify firms with favourable performance.

Firms with favourable performance have higher firm value compared to firms with unfavourable performance with several characteristics:

1. Firm's Management do not conduct earning manipulation;
2. Strong financial position; and
3. Not in financial distress

Based on the above issues, it would be beneficial to do research about the influence of earning manipulation, strength of financial position and financial distress toward firm value with the following research questions: does earning manipulation have a significant effect on firm value; does strength of financial position have a significant effect on firm value, and does financial distress have a significant effect on firm value?

Hypothesis Formulation

Professor Messod Beneish (1999) developed a model as a framework with the primary purpose to identify the relationship between the probability of financial manipulations and financial statement variables. He published an empirical equation that employs eight financial ratios to detect earnings manipulation. The equation as follow

M=-4.84 + 0.92* DRSI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI – 0.172*SGAI+4.679*TATA – 0.327*LVGI

Where:

- DSRI is Days Sales in Receivables Index. This measures the increase in receivables and revenues between two reporting periods. [The day sales in receivable of the current and prior year are compared with the objective of revealing inflated revenue (Beneish, 1999)]
- DEP is Depreciation Index [The ratio measures the depreciation rate of the current compared to prior year. Slower rates of depreciation may indicate an entity is revising useful life upwards or is adopting an income friendly method of depreciation (Beneish, 1999)].
- SGI is Sales Growth index. [The ratio measures current sales versus prior year (Beneish, 1999)]
- LVCI is Leverage Index. [Total debt is compared with total assets of current to prior year (Beneish, 1999)].
- TATA is Total Accruals to Total Assets [The ratio measures the extent to management undertake discretionary accounting policies that translate Tinto altering of earnings (Beneish, 1999).
- GMI is Gross Margin lndex [The ratio measures the gross margin or current one and compares with prior year. An entity with poor growth prospect is more likely to manipulate (Beneish, 1999)]

- AQI is Asset Quality Index [Non-current assets excluding property plant and equipment are compared with total assets with an AQI greater than 1 revealing the entity has either increased its intangibles or cost deferral hence creating earnings manipulation (Beneish, 1999)]
- SGAI is Sales, General and Administrative Expenses Index [The ratio measures current sales versus prior year (Beneish, 1999)]

And if M > -2.22, firm is likely to be a manipulator.

According to Damodaran (2012) firms generally manage earnings because The believe that they will be rewarded Bay markets for delivering earnings that are smoother and come in consistently above analyst estimates. This is Common practice, and accounting standards provide opportunities in doing so.

However, this practice give incentives for firms facing financial distress to manipulate earnings by altering depreciation rates, delaying when expenses are recognized, registering sale early or other creating accounting tricks. This may not necessarily be illegal, but can be used to disguise if a company is suffering financial difficulty (often to maintain share price).

Based on above explanation, we formulate H1 as follows:

Hypothesis l: The degree of a firm's earning manipulation effects firm's value

Piotroski (2000) prepared an evaluation scale about the historical financial performance in order to separate winners (with the highest score: 9) from losers (with the lowest score: 0), this score is one way to proceed when we want to assess a company, in terms of the "financial attractiveness".

The Piotroski score is a discrete score between 0-9 which reflects nine criteria used to determine the strength of a firm's financial position. The Piotroski score is used to determine the best value stocks, nine being the best. For Every criteria (below) that is met the company is given one point, if it is not met, then on points are awarded. The points are then added up to determine the best value stocks.

- Net Income Score
- Operating Cash Flow Score
- Return on Assets Score
- Quality of Earnings Score
- Long-Term Debt to Assets Score
- Current Ratio Score

- Shares Outstanding Score
- Gross Margin Score
- Asset Turn over Score

The formula of Piotroski sore is as follow:

F_SCORE = F_ROA + F_ΔROA + F_CFO + F_ACCRUAL + F_ΔMARGIN + F_ΔTURN + F_ΔLEVER + F_ΔLIQUID + EQ_OFFER

Piotroski (2000) showed that firms earning higher ROA, have higher Operating Cash Flows, better Profit Margins, and higher Asset Turnovers, consistently earn higher returns.

Based on above explanation, we formulate H2 as follow:

Hypothesis 2: The strength of a firm's Financial position effect firm's value

Raisyte et al. (2013) show that the relationship between realised return (read: firm value) and financial distress risk (read: firm distress) is found to be negative. On the contrary, the association between the alternative proxy for expected returns-implied cost of equity - and financial distress risk is found to be positive, meaning that investors account for financial distress risk in their *ex ante* expectation.

Rama, Kafir D (2012), in his research empirically tests the Altman (1968) failure prediction model, and concludes that this model is a viable tool in predicting company failure for firms with positive Z-scores, and where Z-scores do not fall into the range of uncertainty as defined. The research results also suggest that the model is not reliable when the Z-scores are negative or when they are in the range of uncertainty (also known as Grey Zone).

The Z-Score was developed in 1968 by Edward I. Altman, an Assistant Professor of Finance at New York University, as a quantitative balance-sheet method of determining a company' s financial health.

The Altman Z-score is a combination of five weighted business ratios that is used to estimate the likelihood of financial distress.
$Z = .012X_1 + .014X_2 + .033X_3 + .006X_4 + .999X_5$
Where:
X_1 = Working capital/Total assets
X_2 = Retained Earnings/Total assets
X_3 = Earnings before interest and taxes/Total assets
X_4 = Market value equity/Book value of total debt

X_5 = Sales/Total assets
Z = Overall Index

The Z-score results usually have the following interpretation:

- Z Score above 2.67 "Sal-e" Zones. The company is considered 'Safe' based on the financial figures only.
- 1.8 < Z < 2.67 "Grey" Zones. There is a good chance the company going bankrupt within the next 2 years operations.
- Z below 1.80 "Distress" Zones. The score indicates a high probability of distress within this time period.

Based on above explanation, we formulate H3 as follow:

Hypothesis 3: The degree of a firm's financial distress effect firm's value

Research Methodology

Population of this research is manufacturing company listed in Indonesia Stock Exchange for 2014-2016. Data for this research is obtained from financial statement published by public manufacturing company from 2014-2016. The sample of this research is taken using purposive sampling method. Using this method, sample is not taken randomly and uses some considerations and criteria. The criteria of sample selection for this research are as follows:

- The company had positive equity in 2014, 2015 and 2016;
- the company had net income in 2014, 2015, and 2016;
- the company paid cash dividend in 2014, 2015, and 2016; and
- there is no incompleteness of data for 2014-2016

Independent variables in this research are earning manipulation, strength of financial position and financial distress, while the Dependent variable of this research is firm value. Firm value is defined as market value because firm value can create maximum welfare to the shareholders if the company's share price is increased (Hasnawati as cited from Wijaya et al. 2010)). In this research, firm value is measured by Price Book Value.

$$PBV = \frac{Price}{Book\ Value}$$

Analysis method used in this research is panel data analysis. Hypothesis testing conducted with panel data regression model. The first step is to determine the best data panel model for

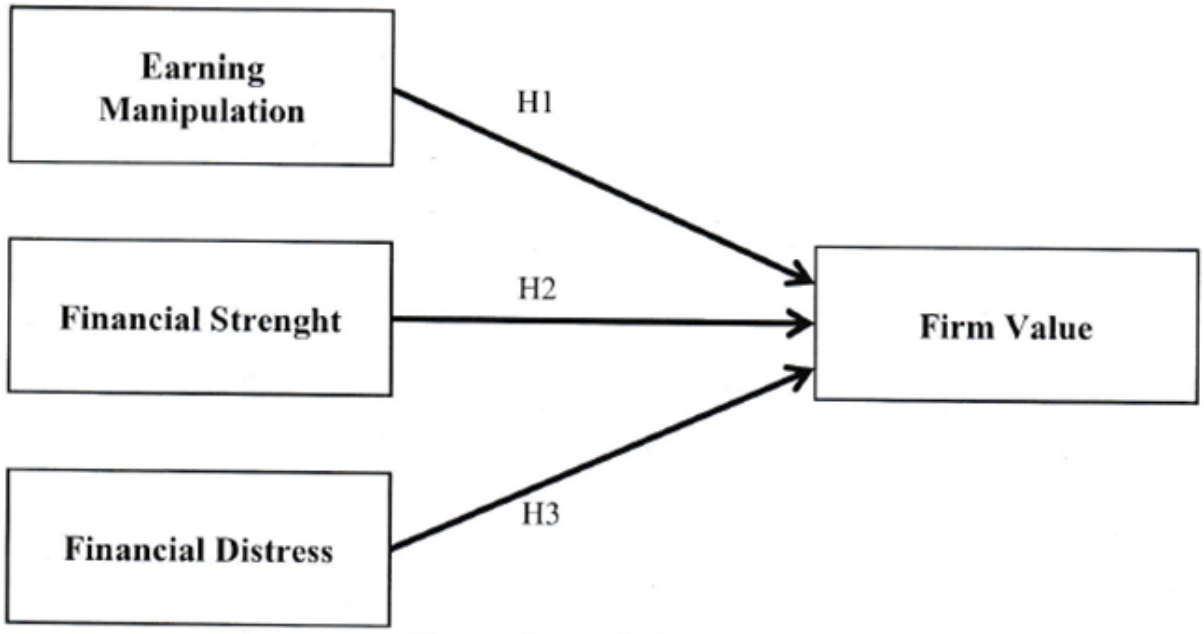
this research. To do that we conduct the Chow Test, continue with the Hausmann Test and Random Effect Model (REM). Final result from these tests is panel equation model.

The Panel Equation models is a combination of data cross section and time series data is as follows:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \cdots + \beta_n X_{nit} + e_{it}$$

After obtaining the equation, we continue with the statistic criteria to determine whether independent variables effect dependent variable, depicted by following research framework

Figure 1. Research Framework



Result and Discussion

Chow Test

We conducted the Chow Test to determine which model shall be fit for analysis between common effect model or (CEM) or fixed effect model (FEM). Following are the test steps

1. Conduct analysis using CEM and result as follows:

Figure 2. CEM Test Result

Dependent Variable: PBV
Method: Panel Least Squares
Date: 06/12/18 Time: 20:14
Sample: 2014 2016
Periods included: 3
Cross-sections included: 42
Total panel (unbalanced) observations: 125

Variable	Coefficient	Std. Error	t-Statistic	Prob.
F	-0.005809	0.537120	-0.010816	0.9914
M	-0.054697	0.075317	-0.726222	0.4691
Z	0.632378	0.157803	4.007389	0.0001
C	1.247335	2.915809	0.427783	0.6696

R-squared	0.122926	Mean dependent var	4.883760
Adjusted R-squared	0.101181	S.D. dependent var	9.896185
S.E. of regression	9.382186	Akaike info criterion	7.346979
Sum squared resid	10651.07	Schwarz criterion	7.437485
Log likelihood	-455.1862	Hannan-Quinn criter.	7.383747
F-statistic	5.652919	Durbin-Watson stat	0.973266
Prob(F-statistic)	0.001169		

2. Now we shall determine whether FEM is better than CEM. For this purpose, we develop following hypothesis

i. H_0: If Chi Square > 0,05 then accept CEM
ii. H_0: If Chi Square < 0,05 then reject H_0 and accept FEM

3. Using the Chow test, we obtain the following result:

Figure 3: Chow Test Result

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	3.313871	(41,80)	0.0000
Cross-section Chi-square	124.080481	41	0.0000

Cross-section fixed effects test equation:
Dependent Variable: PBV
Method: Panel Least Squares
Date: 06/13/18 Time: 05:20
Sample: 2014 2016
Periods included: 3
Cross-sections included: 42
Total panel (unbalanced) observations: 125

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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Prob(F-statistic)	0.001169		

Test results of Chow conducted visible value of the probability of Chi-square numbers shows 0.000. Thus H_0 repelled, in other words the conclusion that the fixed effect model did better than the common effect model

Hausmann Test

Once FEM is selected through the Chow Test Chow, the next thing to do is a Hausmann test method for determining which is better, the fixed effect model (FEM) or the random effect models (REM). To select the right model used the following hypothesis

i. H_0: If Chi Square > 0,05 then accept REM

ii. H_0: If Chi Square < 0,05 then reject H_0 and accept FEM

The calculation results as follow:

Figure 4. Hausmann Test Result

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.128737	3	0.5461

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
F	0.088456	0.081749	0.030047	0.9691
M	-0.032842	-0.037213	0.000573	0.8551
Z	0.398004	0.554801	0.013082	0.1704

Based on the Hausmann test results above, the value of the Chi Square of 0.5461 was retrieved. So based on the hypothesis, H_0 accepted, in other words, the most appropriate model used is the random effect model.

Random Effect Model

Following are the results of the regression data based on the random effects model (REM).

Figure 5. REM Test Result

Dependent Variable: PBV
Method: Panel EGLS (Cross-section random effects)
Date: 06/13/18 Time: 05:28
Sample: 2014 2016
Periods included: 3
Cross-sections included: 42
Total panel (unbalanced) observations: 125
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
F	0.081749	0.459937	0.177739	0.8592
M	-0.037213	0.064295	-0.578789	0.5638
Z	0.554801	0.159667	3.474741	0.0007
C	1.509607	2.721342	0.554729	0.5801

Effects Specification	S.D.	Rho
Cross-section random	6.432730	0.4561
Idiosyncratic random	7.024280	0.5439

Weighted Statistics

R-squared	0.092552	Mean dependent var	2.670023
Adjusted R-squared	0.070054	S.D. dependent var	7.454455
S.E. of regression	7.164522	Sum squared resid	6210.975
F-statistic	4.113675	Durbin-Watson stat	1.655897
Prob(F-statistic)	0.008103		

Unweighted Statistics

R-squared	0.120066	Mean dependent var	4.883760
Sum squared resid	10685.80	Durbin-Watson stat	0.962467

The regression equations obtained based on the image above is the following:
$Y_{it} = 1{,}51 + 0{,}08X_{1it} - 0{,}04X_{2it} + 0{,}55X_{3it}$

We will inquiry further about statistic criteria from that equation to determine whether independent variables effects dependent variable.

a. Partial Significant Test (t-test)

Significant partial test or commonly known as the t-test is a test used to see partially whether each independent variable significantly affecting the dependent variable. To figure it out, then a test is performed with the hypothesis as follows

i. H_0 : Independent variable does not affect dependent variable
ii. H_1 : Independent variable does affect dependent variable
Rejection criteria H_0 if prob < 0,05.

Based on the above figure 5, it can be concluded that the independent variables that affect the PBV statistically only variable Z because prob = 0.007 < 0.05, whereas other variables have no effect in the statistics.

b. Test Concurrent Significant (F-test)

Significant concurrent test used to prove whether together or simultaneous independent variables affecting the entire variable is bound. It is seen by the way:

i. If Prob > α (5%), then accept H_0;
ii. If Prob < 0,05 then reject H_0

with:

H_0 = independent variables do not affect dependent variable.
H_1 = independent variables affect dependent variable

From the above analysis results conclude that simultaneously independent variables affect the dependent variables because the value of the probability 0.008 namely < 0.05. Please refer to the column Prob (F-statistics).

c. The coefficient of Determination (R^2 atau R^2 adjusted)

This coefficient is used to measure the extent of the variation of the value of dependent variables, can be explained by its independent variables. The coefficient of determination of the regression line also indicates the suitability of the data.

The information that is commonly used in data analysis panel are Adjusted R-squared. From the figure 5 above, conclude that Adjusted R-squared value 0.07 meaning 7% variation of the dependent variables is able to be explained by independent variable explained and by the remaining 93% will be explained by other independent variables which not stated in the model.

Based on test statistics above, although only partially Z variable which affects PBV, but simultaneously (overall) of the independent variables affect PBV.

Relating this to hypotheses of this paper mentioned above, we conclude that:

Hypothesis 1: that the degree of a firm's earning manipulation (M-score) effects the firm's value is rejected

Hypothesis 2: that the strength of a firm's Financial position (F-score) effects the firm's value is rejected

Hypothesis 3: that the degree of a firm's financial distress (Z-score) effects the firm's value is accepted.

The rejection of Hypothesis 1 and 2 might be caused by such information but were not the primary concern for most investors. Investors might rely on independent auditor's opinion which is presented together with financial statements, known as the Audited Financial Statements. Thus, there would be lack of opportunity for the management to conduct earning manipulation.

Investors were highly concerned about information about whether a company is in financial distress or not. This information would be available from the audited financial statement. Thus, the investor shall seek this information by other means.

These results also give information that for most investors in BEI information about financial distress (Z-score) is relatively more important than financial position and earning manipulation. Certainly, this result needs further investigation.

Conclusion

Observation on manufacturing companies listed in the Indonesia Stock Exchange using the published financial statement for years ended 2014, 2015 and 2016 conclude that the value of the firm was only affected by financial distress (Z-score). However, all independent variables together affect firm value.

The independent variables in this research were M-Sore, F-Score and Z-Score. The result of this study also suggests that it would be beneficial to look for other independent variables, since those independent variables in the equation model in this research can only explain 7% variation of firm value. Our suggestion for other researchers is to look at cost of capital.

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