THE ESTIMATION OF FINANCIAL TURNAROUND LIKELIHOOD OF FINANCIALLY DISTRESSED FIRMS

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THE ESTIMATION OF FINANCIAL TURNAROUND LIKELIHOOD OF FINANCIALLY DISTRESSED FIRMS

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ABSTRACT

Dynamic economic conditions combined with increasingly rapid pace of change nowadays bring special challenges to any firm in which this condition often drag them into the state of insolvent or bankruptcy. There are several stages before firms reach the state of bankruptcy including financial distress, insolvency, filing of bankruptcy, and administrative receivership. There are three possibilities when firms fall into financial distress condition, one of them is the firm may continue its operations and expect to regain financial stability in which firm may then will be faced by two outcomes: 1) Successful financial turnaround; and 2) Unsuccessful financial turnaround. This research aimed to figure out factors that may influence the probability of financial turnaround for financially distressed firms and use logistic regression in conducting the research. This research also adopted the principle of parsimony that aim to create the simplest model with the least assumptions and variables but with greatest explanatory power which lead to three models generated: 1) Base model; 2) Alternative model 1; and 3) Alternative model 2. Results of the research found that three of five independent variables including free assets, asset retrenchment, and level of leverage had significant impact toward the likelihood of financial turnaround. Meanwhile, two other independent variables including prospective earnings and firm size had no significant impact. Results of the research also found that only firm size and asset retrenchment that gave positive impact toward the likelihood of financial turnaround. Conversely, prospective earnings, free assets, and level of leverage give negative impact. The best model in estimating the likelihood of financial turnaround of financially distressed firm was alternative model 2 which yield the greatest explanatory power as presented by overall predictions accuracy of 83.33%.

Keywords: Financial Turnaround, Financial Distress, Prospective Earnings, Free Assets, Firm Size, Asset Retrenchment, Level of Leverage

ABSTRAK

Kondisi ekonomi yang dinamis dikombinasikan dengan laju perubahan yang semakin pesat membawa tantangan khusus bagi perusahaan manapun yang mana kondisi ini sering menyeret perusahaan ke dalam keadaan pailit atau bangkrut. Ada beberapa tahap sebelum perusahaan mencapai keadaan bangkrut termasuk kesulitan keuangan, kepailitan, pengajuan kebangkrutan, dan penerimaan administratif. Terdapat tiga kemungkinan ketika perusahaan jatuh ke dalam kondisi kesulitan keuangan, salah satunya adalah perusahaan dapat melanjutkan operasinya dan berharap untuk mendapatkan kembali stabilitas keuangan di mana perusahaan tersebut kemudian akan menghadapi dua kemungkinan: 1) Financial turnaround yang sukses; dan 2) Financial turnaround yang gagal. Penelitian ini bertujuan untuk mengetahui faktor-faktor yang dapat mempengaruhi probabilitas financial turnaround pada perusahaan yang mengalami kesulitan keuangan dan menggunakan regresi logistik dalam teknik pengolahan data. Penelitian ini juga mengadopsi prinsip parsimoni yang bertujuan untuk menciptakan model yang paling sederhana dengan asumsi dan variabel yang paling sedikit namun dengan kekuatan penjelas terbesar dimana hal ini mengarah kepada pembentukan tiga model yaitu: 1) Model dasar; 2) Model alternatif 1; dan 3) Model alternatif 2. Hasil penelitian menemukan bahwa tiga dari lima variabel bebas termasuk aset bebas, pengurangan aset, dan tingkat leverage memiliki dampak yang signifikan terhadap kemungkinan financial turnaround. Sementara itu, dua variabel bebas lainnya termasuk laba prospektif dan ukuran perusahaan tidak memiliki dampak yang signifikan. Hasil penelitian juga menemukan bahwa hanya ukuran perusahaan dan penghematan aset yang memberikan dampak positif terhadap kemungkinan financial turnaround. Sebaliknya, laba prospektif, aset bebas, dan tingkat leverage memberikan dampak yang negatif. Model terbaik dalam mengestimasi probabilitas terjadinya financial turnaround pada perusahaan yang mengalami kesulitan keuangan adalah model alternatif 2 yang menghasilkan kekuatan penjelas terbesar sebagaimana ditunjukkan oleh keseluruhan akurasi prediksi sebesar 83,33%.

Kata Kunci: Financial Turnaround, Kesulitan Keuangan, Penghasilan Prospektif, Asset Bebas, Ukuran Perusahaan, Pengurangan Aset, Tingkat Leverage

1. Background of the Study

Dynamic economic conditions combined with increasingly rapid pace of change nowadays brings a special challenge to every firm. Often, rapid change cannot be well anticipated by firms which eventually drag them into the state of insolvent or bankruptcy. According to Wruck (1990), there are stages to be passed by firms before it can be categorized as insolvent: financial distress, insolvency, filing of bankruptcy, and administrative receivership (in order to avoid filing for bankruptcy), for instance. In a more practical terms, one of the indications that has to be fulfilled before a firm can be categorized as financially distressed is if its earnings before

interest, taxes, depreciation and amortization (EBITDA) are less than its financial costs in two consecutive years (Tinoco & Wilson, 2013).

According to Pastena & Rusland (1986), financially distressed firms has three options available: 1) The firm may continue its operations, hoping to regain financial stability, economic recovery, or both; 2) The firm may be able to merge or may be acquired by another firm; and the last option is 3) The firm may file for bankruptcy and liquidate its assets or continue its operations through a successful reorganization. Based on Pastena & Rusland (1986) description, first option may lead to two final states which were: 1) Turnaround firms; and 2) Continued distress firms. A recovery in company's performance from declining or a life-threatening situation that occur in the state of financial distress into an acceptable performance is defined as a turnaround (Barker & Duhaime, 1997).

Several researches showed many factors may influence the likelihood of financially distressed firms to successfully achieve the condition of turnaround and regain healthy financial position. Fletcher (2003) proposed that, respectively, prospective earning and free assets have strong support important indicator and moderate support important indicator of successful turnarounds for distressed firms. Firm size, asset retrenchment and level of leverage also increase the likelihood of financial turnaround according to several literatures.

Positive relation of firm size in the turnaround process is expected based on the assumption that the size is a tangible resource for the firm (Schmuk, 2013). The likelihood of survival of financially distressed firm by combining strategic asset retrenchment has also shown a significant increase. The significant increase in the likelihood of survival is primarily due to reduced leverage and an increased focus on core competencies in retrenchment actions, as well as the productivity growth achieved by divestitures of less productive plants (Schweizer & Nienhaus, 2017). Based on previous research, the lower the level of leverage of the firm, the higher the probability of turnaround which in line with Giroud et al. (2012) who stated that debt reduction has also found to contribute a significant improvements in firm performance. The importance of this research is that every financially distressed firm that choose to continue its operations had the potential for turnaround. Hence, researcher was interested to conduct a study toward the estimation of financial turnaround likelihood of financially distressed firms.

2. Literature Review
2.1. Financial Distress
2.1.1. Definition of Financial Distress

Financial distress can be defined as a condition where firms experience decline in financial performance as well as decrease in financial stability or so called financial difficulties which increase firm's bankruptcy risk. According to

Purnanandam (2007), a low cash-flow state of the firms that suffer losses without being insolvent is defined as financial distress condition. Tinoco & Wilson (2013) offered a more practical definition which they argued that if firm's financial cost is more than its EBITDA in at least two consecutive years, a firm can be categorized as financially distressed firm.

2.1.2. The Cause of Financial Distress

There are several factors that can drag down the performance of the firm to enter financial distress condition. External factors such as industry downturn can be one of the causes of financial distress in certain industries (Asquith, Gertner, & Scharfstein, 1994). Internal factors are usually more dominant to become the primary cause of financial distress. The statement is supported by Whitaker (1999) who argued that poor management leads the firm into financial distress condition in most cases, compared to the effects of economic distress.

2.1.3. The Measurement of Financial Distress

A firm that is currently in financial distress condition has difficulties in meeting its obligations that are already matured. Regarding the ability of the firm in paying its obligations which directly related to the cause of insolvency or bankruptcy, Sun et al. (2014) also stated the inability to pay debts or preferred dividend are signs which usually found on financially distressed firms. For the purpose of this research, practical terms were used to determine whether a firm is in financial distress condition or not were stated by Tinoco & Wilson (2013) who categorized a firm is in financial distress if its EBITDA are less than its reported financial expenses for two consecutive year.

2.2. Financial Turnaround
2.2.1. Definition of Financial Turnaround

Barker & Duhaime (1997) stated that successful financial turnaround occurs when firm is able to reverse its performance from decline that threatens its ability to survive, in which at the end the firm will be able to achieve a sustainable profitability. It is a general guideline that financial turnaround is characterized by the increase in profitability level of the firm. On the other hand, a successful financial turnaround is often associated with a firm's ability in regaining a sustainable competitive advantage (Lohrke, Bedeian, & Palmer, 2004).

2.2.2. The Measurement of Financial Turnaround

Pearce & Robbins (1993) argued that successful turnaround described as financial or market measures of the relative success of the troubled firm in returning to pre-downturn performance levels. The firm also needs to be able to maintain its profitability (Barker & Duhaime, 1997). Based on the definition of financial turnaround, a practical term to categorize successful financial turnaround

firm is as follows: 1) The firm's financial condition is no longer in distress; and 2) The firm must be able to continue its good performance.

2.3. Factors that Influence the Likelihood of Financial Turnaround
2.3.1. Prospective Earnings

According to Fletcher (1993), earnings prospects have the proxy of return on assets (ROA) which is calculated as operating income from continuing operations before taxes and depreciation, divided by net operating assets. He also stated that return on asset is a measurement of firm's profitability and within his study, return on asset is the best variable to predict distressed firms that recovered and those that did not (Fletcher, 1993). Based on several theoretical bases and previous studies above, the hypothesis is developed by researcher as follow:

> H1: Prospective earnings have significant and positive impact influence on the likelihood of financial turnaround.

2.3.2. Free Assets

Suratno et al. (2017) defined that free assets has significant positive effect on the turnaround as larger free assets will help enlarge the possibilities to bounce from difficult situation. Based on several theoretical bases and previous studies above, the hypothesis is developed by researcher as follow:

> H2: Free assets have significant and positive influence on the likelihood of financial turnaround.

2.3.3. Firm Size

Firm size has an influence on the probability of financial turnaround in companies experiencing financial distress. According to Trahms et al. (2013), organizational theory has noted that the mortality rates of firms decline with increased size. Based on several theoretical bases and previous studies above, the hypothesis is developed by researcher as follow:

> H3: Firm size has significant and positive influence on the likelihood of financial turnaround.

2.3.4. Asset Retrenchment

Asset retrenchment is a consequence of a steep performance decline which a firm's financial performance is extremely poor (Barker & Mone, 1994). Based on previous researches, asset retrenchment has an influence on the probability of a successful firm's financial turnaround. The result of study conducted by Robbins & Pearce (1992) found that declining firms which do not retrench will be less likely to turn around and will continue to have declining performance. Based on several theoretical bases and previous studies above, the hypothesis is developed by researcher as follow:

H4: Asset retrenchment has significant and positive influence on the likelihood of financial turnaround. (Asset growth has significant and negative influence on the likelihood of financial turnaround).

2.3.5. Level of Leverage

Level of leverage is one of the important variables that have impact on the firm performance, especially on financial distress and financial turnaround. Asquith et al. (1994) and James (1996) argued that debt composition is important for turnaround. Based on several theoretical bases and previous studies above, the hypothesis is developed by researcher as follow:

H5: Level of leverage has significant and negative influence on the likelihood of financial turnaround.

2.4. Theoretical Framework
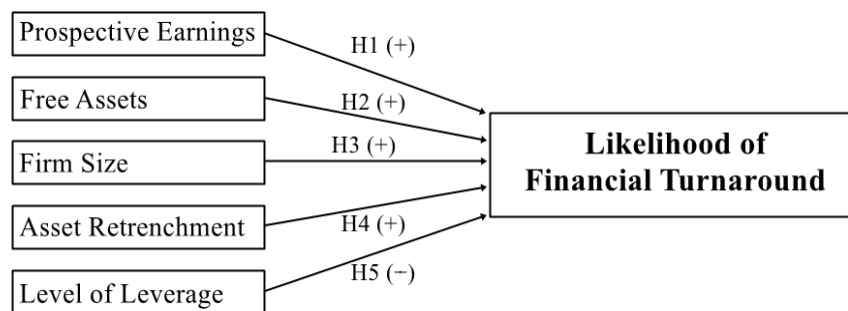
Figure 2.1. Conceptual Framework

The figure above illustrates the framework of thought including dependent variable and independent variables of the research.

3. Research Method
3.1. Population and Sample

The population in this research was all companies that included in the classification of secondary sectors based on Jakarta Stock Industrial Classification. Determination of the sample in this research was conducted by using purposive sampling method, the sampling criteria were as follows: 1) Companies that fell into the category of secondary sectors of JASICA and successively listed on the IDX within the period of 2005-2016; 2) Companies that had been IPO and listed in IDX at least since 2005; 3) Companies that consistently published complete financial statements in the 2005-2016 period; 4) The remaining sample will be categorized based on the condition of the company.

3.2. Source of Data

The data used in this research was documentary data. Data collected through indirect observation (secondary data), i.e. by collecting financial reports of companies obtained from The Indonesian Capital Market Institute (TICMI),

Indonesia Stock Exchange (IDX), and Morningstar. The data required was in the form of financial statements of companies in the period of 2005-2016.

3.3. Research Variables

This research used variable which consisted of dependent variable and independent variable. Dependent variable in this research was likelihood of financial turnaround in company experiencing financial distress. Independent variables included prospective earnings, free assets, firm size, asset retrenchment and level of leverage.

3.3.1. Likelihood of Financial Turnaround

The dependent variable in this research was the probability of achieving the successful financial turnaround condition of a company experiencing financial distress. If the company succeeded in achieving a financial turnaround, the company was assigned with value of 1 for STATE. In the other hand, if the company failed to achieve a financial turnaround, the assigned value was 0 for STATE.

3.3.2. Prospective Earning (PEARN)

According to Fletcher (1993), earnings prospects is proxy by return on assets (ROA) which is calculated as operating income from continuing operations before taxes and depreciation, divided by net operating assets. Based on literature review, prospective earning may increase the likelihood of the financial turnaround. In this research, prospective earning was calculated as earnings before interest, tax, depreciation and amortization (EBITDA) divided by total asset (Fletcher, 1993).

3.3.3. Free Assets (FASSETS)

Based on literature review, proportion of firm's free assets may increase the likelihood of the financial turnaround. Several previous studies have argued that free assets have an influence toward the success of a financial turnaround in firms who experienced financial distress. In this research, free assets were measured by the proportion of firm total asset available after being deducted by firm total liability toward firm total asset (Francis & Desai, 2005).

3.3.4. Firm Size (FSIZE)

According to several literatures, firm size has an influence on the probability of financial turnaround in companies experiencing financial distress. Based on literature review, asset retrenchment may increase the likelihood of the financial turnaround. In this research, firm size was measured by natural logarithm of total sales (Francis & Desai, 2005).

3.3.5. Asset Retrenchment (ASSETR)

The sale of company assets is an efficiency measure. The reduction of assets is done by the company hoping that the decrease in less productive assets can increase asset utilities more effectively and more efficiently. Based on literature review, asset

retrenchment may increase the likelihood of the financial turnaround. In this research, asset retrenchment was measured by percentage change in total assets of the current period with total assets of previous period (Francis & Desai, 2005).

3.3.6. Level of Leverage (LOLEV)

Based on literature review, level of leverage may increase the likelihood of the financial turnaround. In other word, increase in leverage may increase the probability of corporate financial turnaround. In this research, level of leverage was measured by debt-to-asset ratio as mentioned by Zingales (1998), which in his study he used capital structure to measure the level of leverage. Debt-to-asset ratio was used in order to measure firm's level of leverage as this indicator had advantage in which the result would always be in positive figure.

3.4. Analysis Technique

3.4.1. Descriptive Statistics

Descriptive statistics were used to analyze and present quantitative data in order to describe the data. Descriptive statistic was used to find out the mean, median, minimum and maximum values and standard deviation. The data studied was grouped into two categories, namely successful financial turnaround firms and unsuccessful turnaround firms.

3.4.2. Hypothesis Testing

Hypothesis testing was done by using logistic regression method because it had one non-metric (binary scales) dependent variable and had more than one independent variable.

Here is the logistic regression model proposed:

$$Ln\ \frac{p}{1-p} = b0 + b1PEARN + b2FASSETS + b3FSIZE + b4ASSETR + b5LOLEV$$

Where:

p	= Probability of financial turnaround	FASSETS	= Free assets
		FSIZE	= Firm size
b0	= Constants	ASSETR	= Asset retrenchment
b1 – b5	= Coefficient of independent variable	LOLEV	= Level of leverage
PEARN	= Prospective earnings		

4. Data Analysis and Discussion

4.1. Descriptive Statistic

Descriptive statistic was used to describe general overview of the firms that was categorized into successful financial turnaround (SFT) and unsuccessful financial turnaround (UFT) for each independent variable in the model.

Table 4.1

Table 4.1
Descriptive Statistic of Sample

Variable	UFT					SFT				
	Mean	Median	Max	Min	St. Dev.	Mean	Median	Max	Min	St. Dev.
PEARN	-0.0210	-0.0286	0.1152	-0.1275	0.0668	-0.1123	-0.0407	0.0436	-0.5580	0.1944
FASSETS	-0.1888	0.2862	0.8773	-4.0561	1.3060	-0.0068	0.0818	0.8751	-1.7881	0.7918
FSIZE	22.0158	21.0608	28.5178	14.7394	4.7172	22.8859	24.8832	29.2571	11.7871	4.8652
ASSETR	0.0616	-0.0058	0.4746	-0.0932	0.1511	-0.0901	-0.0500	0.1795	-0.4276	0.1804
LOLEV	0.9219	0.5341	4.6828	0.0000	1.2959	0.6259	0.5786	2.0255	0.0000	0.6023

UFT: Unsuccessful Financial Turnaround; SFT: Successful Financial Turnaround; PEARN: Prospective Earnings; FASSETS: Free Assets; FSIZE: Firm Size; ASSETR: Asset Retrenchment; LOLEV: Level of Leverage.
Source: Secondary data processed, 2018

4.2. Hypothesis Testing

In order to create the best model, researcher adopted the principle of parsimony, in which the principle aimed to create the simplest model with the least assumptions and variables but with greatest explanatory power (Fritz, Brandon, & Xander, 1984). In logistic regression model where the dependent variable was binary, explanatory power was presented by the predictive power of the model.

4.2.1. Base Model

The first analysis was conducting evaluation of the logistic regression model and goodness of fit test as measured by Chi-Square on Hosmer and Lemeshow test.

Table 4.2
Evaluation of the Logistic Regression Model – Base Model

```
Goodness-of-Fit Evaluation for Binary Specification
Andrews and Hosmer-Lemeshow Tests
Equation: UNTITLED
Date: 05/12/18  Time: 14:29
Grouping based upon predicted risk (randomize ties)
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	Quantile of Risk		Dep=0		Dep=1		Total	H-L
	Low	High	Actual	Expect	Actual	Expect	Obs	Value
1	0.0210	0.0381	2	1.94085	0	0.05915	2	0.06095
2	0.0615	0.0628	2	1.87565	0	0.12435	2	0.13260
3	0.0903	0.1625	2	2.63720	1	0.36280	3	1.27308
4	0.1790	0.1915	2	1.62954	0	0.37046	2	0.45469
5	0.2481	0.3524	1	2.14725	2	0.85275	3	2.15642
6	0.4084	0.4372	2	1.15436	0	0.84564	2	1.46512
7	0.5303	0.6116	1	0.85805	1	1.14195	2	0.04113
8	0.7119	0.8727	1	0.57671	2	2.42329	3	0.38463
9	0.9300	0.9386	0	0.13141	2	1.86859	2	0.14065
10	0.9670	0.9945	0	0.04899	3	2.95101	3	0.04981
		Total	13	13.0000	11	11.0000	24	6.15907

H-L Statistic		6.1591	Prob. Chi-Sq(8)		0.6294
Andrews Statistic		21.6985	Prob. Chi-Sq(10)		0.0167

Source: Secondary data processed, 2018

Table 4.3
Expectation-Prediction Evaluation – Base Model

Expectation-Prediction Evaluation for Binary Specification
Equation: UNTITLED
Date: 05/12/18 Time: 14:44
Success cutoff: C = 0.5

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)<=C	11	3	14	13	11	24
P(Dep=1)>C	2	8	10	0	0	0
Total	13	11	24	13	11	24
Correct	11	8	19	13	0	13
% Correct	84.62	72.73	79.17	100.00	0.00	54.17
% Incorrect	15.38	27.27	20.83	0.00	100.00	45.83
Total Gain*	-15.38	72.73	25.00			
Percent Gain**	NA	72.73	54.55			

Source: Secondary data processed, 2018

Table 4.4
Result of Logistic Regression – Base Model

Dependent Variable: STATE
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Date: 05/12/18 Time: 13:40
Sample: 1 24
Included observations: 24
Convergence achieved after 5 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
PEARN	-8.911013	7.295259	-1.221480	0.2219
FASSETS	-6.534535	3.730417	-1.751690	0.0798
FSIZE	0.273550	0.183913	1.487384	0.1369
ASSETR	-9.190757	4.578754	-2.007262	0.0447
LOLEV	-6.971391	3.888727	-1.792718	0.0730
C	-2.031574	4.528896	-0.448581	0.6537

McFadden R-squared	0.430790	Mean dependent var	0.458333
S.D. dependent var	0.508977	S.E. of regression	0.420920
Akaike info criterion	1.285135	Sum squared resid	3.189125
Schwarz criterion	1.579648	Log likelihood	-9.421615
Hannan-Quinn criter.	1.363269	Deviance	18.84323
Restr. deviance	33.10420	Restr. log likelihood	-16.55210
LR statistic	14.26097	Avg. log likelihood	-0.392567
Prob(LR statistic)	0.014034		

Obs with Dep=0	13	Total obs	24
Obs with Dep=1	11		

Source: Secondary data processed, 2018

As showed on Table 4.3, the overall accuracy of this model was 79.17%, where the accuracy rate in estimating companies that fell into the category of unsuccessful financial turnaround showed slightly greater accuracy at the level of 84.62% compared to the estimation accuracy of firms that fell into the category of successful financial turnaround that showed the accuracy rate of 72.73%.

Table 4.4 above showed the results of data processing and provided information related to the last analysis of the hypothesis test. From the base model, it can be stated that the interpretation of output variable in the equation model's as follows:

$$Ln\ \frac{p}{1-p} = -2.0316 - 8.9110\ PEARN - 6.5345\ FASSETS$$
$$+ 0.2736\ FSIZE - 9.1908\ ASSETR - 6.9714\ LOLEV$$

4.2.2. Alternative Model 1

The first analysis was conducting evaluation of the logistic regression model and goodness of fit test as measured by Chi-Square on Hosmer and Lemeshow test.

Table 4. 5

Evaluation of the Logistic Regression Model – Alternative Model 1

Goodness-of-Fit Evaluation for Binary Specification
Andrews and Hosmer-Lemeshow Tests
Equation: UNTITLED
Date: 05/18/18 Time: 12:18
Grouping based upon predicted risk (randomize ties)

	Quantile of Risk Low	Quantile of Risk High	Dep=0 Actual	Dep=0 Expect	Dep=1 Actual	Dep=1 Expect	Total Obs	H-L Value
1	0.0366	0.0882	2	1.87519	0	0.12481	2	0.13312
2	0.0950	0.0956	2	1.80937	0	0.19063	2	0.21071
3	0.1210	0.1377	3	2.61889	0	0.38111	3	0.43657
4	0.1448	0.1679	1	1.68731	1	0.31269	2	1.79068
5	0.1953	0.3394	2	2.17683	1	0.82317	3	0.05235
6	0.5719	0.6161	1	0.81202	1	1.18798	2	0.07326
7	0.6301	0.6308	1	0.73909	1	1.26091	2	0.14610
8	0.6381	0.7177	1	0.98074	2	2.01926	3	0.00056
9	0.8888	0.9179	0	0.19336	2	1.80664	2	0.21406
10	0.9552	0.9719	0	0.10720	3	2.89280	3	0.11117
		Total	13	13.0000	11	11.0000	24	3.16858

H-L Statistic		3.1686	Prob. Chi-Sq(8)		0.9233	
Andrews Statistic		21.8899	Prob. Chi-Sq(10)		0.0157	

Source: Secondary data processed, 2018

Table 4. 6
Expectation-Prediction Evaluation – Alternative Model 1

Expectation-Prediction Evaluation for Binary Specification
Equation: UNTITLED
Date: 05/18/18 Time: 12:18
Success cutoff: C = 0.5

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)<=C	10	2	12	13	11	24
P(Dep=1)>C	3	9	12	0	0	0
Total	13	11	24	13	11	24
Correct	10	9	19	13	0	13
% Correct	76.92	81.82	79.17	100.00	0.00	54.17
% Incorrect	23.08	18.18	20.83	0.00	100.00	45.83
Total Gain*	-23.08	81.82	25.00			
Percent Gain**	NA	81.82	54.55			

Source: Secondary data processed, 2018

Table 4. 7
Result of Logistic Regression – Alternative Model 1

Dependent Variable: STATE
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Date: 05/18/18 Time: 12:15
Sample: 1 24
Included observations: 24
Convergence achieved after 4 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
FASSETS	-8.063508	3.855719	-2.091311	0.0365
FSIZE	0.168229	0.142665	1.179192	0.2383
ASSETR	-9.007664	4.189209	-2.150206	0.0315
LOLEV	-8.483557	4.019772	-2.110457	0.0348
C	1.819454	3.354659	0.542366	0.5876

McFadden R-squared	0.367137	Mean dependent var	0.458333
S.D. dependent var	0.508977	S.E. of regression	0.430040
Akaike info criterion	1.289601	Sum squared resid	3.513750
Schwarz criterion	1.535029	Log likelihood	-10.47521
Hannan-Quinn criter.	1.354713	Deviance	20.95042
Restr. deviance	33.10420	Restr. log likelihood	-16.55210
LR statistic	12.15378	Avg. log likelihood	-0.436467
Prob(LR statistic)	0.016244		

Obs with Dep=0	13	Total obs	24
Obs with Dep=1	11		

Source: Secondary data processed, 2018

As showed on Table 4.6, the overall accuracy of this model was 79.17%, where the accuracy rate in estimating companies categorized as successful financial turnaround showed slightly greater accuracy at the level of 81.82% compared to the estimation accuracy of firms categorized as unsuccessful financial turnaround that showed the accuracy rate of 76.92%.

. From the alternative model 1, it can be stated that the interpretation of output variable in the equation model was as follows:

$$Ln \frac{p}{1-p} = 1.8195 - 8.0635\ FASSETS + 0.1682\ FSIZE$$
$$- 9.0077\ ASSETR - 8.4836\ LOLEV$$

4.2.2. Alternative Model 2

The first analysis was conducting evaluation of the logistic regression model and goodness of fit test as measured by Chi-Square on Hosmer and Lemeshow test. The result was he regression model was appropriate for further analysis as shown on Table 4.8.

<div align="center">

Table 4. 8

Evaluation of the Logistic Regression Model – Alternative Model 2

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Goodness-of-Fit Evaluation for Binary Specification
Andrews and Hosmer-Lemeshow Tests
Equation: UNTITLED
Date: 05/18/18   Time: 12:24
Grouping based upon predicted risk (randomize ties)

	Quantile of Risk Low	High	Dep=0 Actual	Expect	Dep=1 Actual	Expect	Total Obs	H-L Value
1	0.0675	0.0940	2	1.83851	0	0.16149	2	0.17567
2	0.0964	0.0976	1	1.80603	1	0.19397	2	3.70918
3	0.1487	0.1665	2	2.52388	1	0.47612	3	0.68518
4	0.2063	0.2296	2	1.56412	0	0.43588	2	0.55735
5	0.2881	0.3099	3	2.10307	0	0.89693	3	1.27947
6	0.4424	0.5144	1	1.04326	1	0.95674	2	0.00375
7	0.5530	0.6598	1	0.78714	1	1.21286	2	0.09492
8	0.6630	0.7273	1	0.92014	2	2.07986	3	0.01000
9	0.8207	0.9005	0	0.27881	2	1.72119	2	0.32398
10	0.9408	0.9701	0	0.13503	3	2.86497	3	0.14140
	Total		13	13.0000	11	11.0000	24	6.98089

H-L Statistic	6.9809	Prob. Chi-Sq(8)	0.5387
Andrews Statistic	14.1807	Prob. Chi-Sq(10)	0.1649

Source: Secondary data processed, 2018

As showed on Table 4.9, the overall accuracy of this model was 83.33%, where the accuracy rate in estimating companies that categorized as unsuccessful financial turnaround showed greater accuracy at 84.62% compared to the accuracy of successful financial turnaround firms that showed the accuracy rate of 81.82%.

Table 4. 9

Expectation-Prediction Evaluation – Alternative Model 2

Expectation-Prediction Evaluation for Binary Specification
Equation: UNTITLED
Date: 05/18/18   Time: 12:24
Success cutoff: C = 0.5

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)<=C	11	2	13	13	11	24
P(Dep=1)>C	2	9	11	0	0	0
Total	13	11	24	13	11	24
Correct	11	9	20	13	0	13
% Correct	84.62	81.82	83.33	100.00	0.00	54.17
% Incorrect	15.38	18.18	16.67	0.00	100.00	45.83
Total Gain*	-15.38	81.82	29.17			
Percent Gain**	NA	81.82	63.64			

Source: Secondary data processed, 2018

Table 4. 10

Result of Logistic Regression – Alternative Model 2

Dependent Variable: STATE
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Date: 05/18/18   Time: 12:23
Sample: 1 24
Included observations: 24
Convergence achieved after 5 iterations
Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
FASSETS	-6.689480	3.512666	-1.904388	0.0569
ASSETR	-8.245079	4.030976	-2.045430	0.0408
LOLEV	-7.190349	3.751486	-1.916667	0.0553
C	4.744997	2.657055	1.785811	0.0741

McFadden R-squared	0.318703	Mean dependent var	0.458333
S.D. dependent var	0.508977	S.E. of regression	0.423318
Akaike info criterion	1.273074	Sum squared resid	3.583968
Schwarz criterion	1.469417	Log likelihood	-11.27689
Hannan-Quinn criter.	1.325164	Deviance	22.55378
Restr. deviance	33.10420	Restr. log likelihood	-16.55210
LR statistic	10.55042	Avg. log likelihood	-0.469871
Prob(LR statistic)	0.014423		

Obs with Dep=0	13	Total obs	24
Obs with Dep=1	11		

Source: Secondary data processed, 2018

From the alternative model 2, it can be stated that the interpretation of output variable in the equation model was as follows:

$$Ln \frac{p}{1-p} = 4.7449 - 6.6895 \, FASSETS - 8.2451 \, ASSETR - 7.1903 \, LOLEV$$

4.3. Discussion
4.3.1. Logistic Regression Models

Based on the three logistic regression models and based on the principle of parsimony, it can be concluded that alternative model 2 was the best model which had the greatest explanatory power in terms of predicting the likelihood of financial turnaround. Alternative model 2 had the highest overall accuracy of 84.62%, which was 4.16% higher than both base model and alternative model 1.

4.3.2. The Influence of Prospective Earnings on the Likelihood of Financial Turnaround

This variable was only used in base model. The result of logistic regression test showed that prospective earnings variable consistently had the sign of negative regression coefficient with the probability value greater than 0.10 (α). This suggested that prospective earnings had negative influence but not significant on the likelihood of financial turnaround. This might happen because at the time of financial distress, profitability of the firms became the less prioritized factor compared to others such as liquidity and solvency of firms which might be important to pay more attention.

4.3.3. The Influence of Free Assets toward on Likelihood of Financial Turnaround

This variable was used in all of models and showed the same result. The result of logistic regression test showed that free assets variable consistently had the sign of negative regression coefficient with probability value of lower than 0.10 (α). This suggested that free assets had negative influence and significant on the likelihood of financial turnaround. The result of the research that showed the level of free asset had negative and significant influence on the possibility of financial turnaround might be due to the availability of free asset that did not necessarily represent all the asset turnover of the firm and not become the main guarantee of the bank or other financial institution in deciding to lend the capital to the firm experiencing financial distress.

4.3.4. The Influence of Firm Size toward on Likelihood of Financial Turnaround

This variable was used in base model and alternative model 1 in which both models showed the same result. The result of logistic regression test showed that firm size variable consistently had the sign of positive regression coefficient with the probability value of greater than 0.10 (α). This suggested that firm size had positive influence but not significant on the likelihood of financial turnaround. As proposed by Tushman & Romanelli (1985), firm size influence the capacity of a firm to make the necessary adjustments amid a changing environment which related to the ability in implementing turnaround strategy and achieve a successful financial turnaround.

4.3.5. The Influence of Asset Retrenchment on the Likelihood of Financial Turnaround

This variable was used in all of models and showed the same result. The result of logistic regression test showed that asset retrenchment variable consistently had the sign of negative regression coefficient with the probability value of lower than 0.10 (α). This suggested that asset retrenchment had positive influence and significant on the likelihood of financial turnaround. In general, retrenchment refers to efficiency-oriented, short-term turnaround actions, such as downsizing, cost reduction, asset sell-offs, and divestment of businesses.

4.3.6. The Influence of Level of Leverage on the Likelihood of Financial Turnaround

This variable was used in all of models and showed the same result. The result of logistic regression test showed that level of leverage variable consistently had the sign of negative regression coefficient with the probability value of lower than 0.10 (α). This suggested that the level of leverage had negative and significant influence on the likelihood of financial turnaround. High leverage leads to high financing cost for companies which in turn would reduce the company's net income and also drag down the company's performance even further.

5. Conclusions and Recommendations
5.1. Conclusions

1. There were three models of logistic regression generated using parsimony principle where alternative model 2 was the best model in estimating the likelihood of financial turnaround.

2. The results of logistic regression in alternative model 2 yielded a regression model that showed the overall predictions accuracy of 83.33%.

3. Prospective earnings gave negative influence but no significant influence on the likelihood of financial turnaround. Free assets gave negative influence and significant influence on the likelihood of financial turnaround. Firm size gave positive influence but not significant influence on the likelihood of financial turnaround. Asset retrenchment gave negative influence and significant influence on the likelihood of financial turnaround. Level of leverage gave negative influence and significant influence on the likelihood of financial turnaround.

5.2. Recommendations

1. Increase the number of samples in the research by extending the industrial spectrum and the time period of the research.

2. Use factors outside the variables in this research such as macroeconomic and industry condition to obtain more complex model.

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