THE EFECTIVENESS OF OHLSON'S O-SCORE TO PREDICT FINANCIAL DISTRESS OF GO-PUBLIC FIRMS IN INDONESIA FOR THE PERIOD OF 2004-2005

A THESIS

Presented as a Partial Fulfillment of the Requirements

to Obtain the Bachelor Degree in Management Department



By:

APRIANTO NUGRAHA

Student Number: 03311303

DEPARTMENT OF MANAGEMENT
INTERNTIONAL PROGRAM
FACULTY OF ECONOMIC
ISLAMIC UNIVERSITY OF INDONESIA
YOGYAKARTA
2007

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By

APRIANTO NUGRAHA

Student Number: 03311303

Approved By

Content Advisor,

Zaenal Arifin,M.Si., Dr., H. **July 2007**

Language Advisor,

Katarina, S.Pd. **July 2007**

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By

APRIANTO NUGRAHA

Student Number: 03311303

Defended before the Board of Examiners
on July 26, 2007
And Declared Acceptable

Examiner 1

Dwi Praptono Agus Harjito
Dr.,Drs.,Msi.

.....

Examiner 2/Content Advisor

Zaenal Arifin Dr, H., M.Si

.....

Yogyakarta, July 26, 2007
International Program
Faculty of Economics
Islamic University of Indonesia
Dean

UNIVERSITAS ISLAM INDONESIA ★ YOGYAKARTA ★ FAKULTAS EKONOMI

Asmai Ishak, M.Bus., Ph.D

STATEMENT OF FREE PLAGIARISM

Herein I declare the originality of this thesis; there is no other work other work which has ever presented to obtain any university degree, and in my concern there is neither anyone else's opinion nor published written work, accept with acknowledged quotation relevant to the topic of this thesis which have been stated or listed on the thesis bibliography

If in the future this statement is not proven as it supposed to be, I am willing to accept any sanction complying to the determined regulation for its consequences

Yogyakarta,



Aprianto Nugraha

ABSTRACT

Nugraha, Aprianto (2007) "The effectiveness of Ohlson's O-Score to predict financial distress of go-public firms in Indonesia for the period of 2004-2005" Yogyakarta: Management Department, International Program, Faculty of Economics, Universitas Islam Indonesia

The study of predicting financial distress or bankruptcy has already been conducted from many years ago and in different countries. The result of these researches varied depends on the researcher's method and the economical and political condition of the country where the research is conducted. This study is a popular study because every company in each and every country in the world has the risk of experiencing financial distress and bankruptcy. That is why that the research about predicting financial distress and bankruptcy is very important.

This research is conducted with the basis of trying to provide additional information about the prediction tools that can be used in Indonesia. In Indonesia, the study of predicting financial distress and bankruptcy is also popular. The most popular prediction tool in Indonesia is Altman's (1968) *Z-Score*. This tool has its weaknesses and strengths. The weaknesses of this tool can be eliminated if we use Ohlson's (1980) *O-Score*. That is why this research used *O-Score* as its data analysis technique.

This research uses the data of published firm's financial statement in the period of 2004-2005 in Indonesian Capital Market Directory (ICMD). The sampling technique is purposive sampling means that the firms must qualify to a certain criteria in order to be used in the research. The criteria for the distressed firms are delisted from Jakarta Stock Exchange because of financial distress, have loss in three consecutive years (2003-2005), and have loss of more than 75% of its paid-in capital in 2004 and/or 2005. The criterion for solvent firms is having no loss in three consecutive years (2003-2005).

The result of the research shows that Ohlson's (1980) *O-Score* can be used in Indonesia. The result of the predictability of the overall variables also exceeds the original research. In Ohlson's (1980) research, the overall predictability of the variables are 96.3% while this research shows 100% correct for overall variable.

Keyword: financial distress, bankruptcy, O-Score.

ABSTRAK

Nugraha, Aprianto (2007) "The effectiveness of Ohlson's O-Score to predict financial distress of go-public firms in Indonesia for the period of 2004-2005" Yogyakarta: Management Department, International Program, Faculty of Economics, Universitas Islam Indonesia

Penelitian tentang prediksi kesulitan keuangan dan kebangrutan telah banyak dilakukan sejak dulu dan di banyak negara. Hasil penelitian – penelitian ini sangat beragam tergantung dari metode yang digunakan dan keadaan politik dan ekonomi negara tempat penelitian tersebut dilakukan. Penelitian tentang subjek ini sangat populer karena di tiap negara, perusahaan akan menghadapi resiko kebangkrutan dan kesulitan keuangan. Karena alasan inilah penelitian tentang prediksi kebangrutan dan kesulitan keuangan menjadi sangat penting.

Penelitian in dilakukan dilakukan untuk memberikan informasi tambahan tentang studi prediksi kebangrutan dan kesulitan keuangan di Indonesia. Di Indonesia, alat prediksi yang populer adalah alat yang dikembangkan oleh Altman (1968) yaitu *Z-Score*. Alat prediksi ini memiliki kelemahan dan kekuatan tersendiri. Kelemahan dari alat ini dieliminasi dengan penggunaan alat prediksi yang dikembangkan oleh Ohlson (1980) yaitu *O-Score*. Maka dari itu penelitian ini menggunakan *O-Score* sebagai alat analisis.

Penelitian ini menggunakan data laporan keuangan perusahaan tahun 2004-2005 yang diterbitkan dalam Indonesian Capital Market Directory (ICMD). Teknik sampling yang digunakan adalah purposive sampling yang maksudnya adalah perusahaan – perusahaan yang akan digunakan dalam penelitian ini harus memenuhi beberapa kriteria. Kriteria perusahaan dengan kesulitan keuangan adalah di delisting dari Bursa Efek Jakarta, rugi selama 3 tahun berturut – turut (2003-2005), dan rugi lebih dari 75% dari modal disetor pada tahun 2004 dan/atau 2005. Kriteria dari perusahaan sehat adalah tidak mengalami rugi selama 3 tahun berturut – turut (2003-2005).

Hasil penelitian ini menunjukan bahwa alat prediksi *O-Score* dapat digunakan di Indonesia. Hasil penelitian menunjukkan kekuatan prediksi dari keseluruhan variabel yang melebihi penelitian Ohlson (1980). Penelitian Ohlson (1980) menunjukkan kekuatan prediksi sebesar 96.3% sedangkan penelitian ini menunjukkan kekuatan prediksi 100% untuk keseluruhan variabel.

Kata kunci: kesulitan keuangan, kebangkrutan, O-Score.

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CHAPTER I
INTRODUCTION

1.1 Study Background

The former financial distress in Indonesia has caused a major impact on the economic environment in Indonesia. The impact of the recession penetrates into the deepest level of economic system in Indonesia. All micro and macro level are induced by the recession. The constant decline of Rupiah value over US Dollar has a significant influence on the economic condition in Indonesia from the lowest level to the top level of business. By the time Rupiah value drops significantly in a short period, the companies and entrepreneurs whose business use US Dollar to pay the transactions must face a currency lost (Riès, 1999:155).

Companies that used US Dollar as a transaction standard such as export/import companies faced a severe financial distress. The companies that performed "so-so" are most likely to be bankrupt. The large number of companies that went bankrupt suddenly in that era proved that many of the companies didn't prepare well for the occurrence of bankruptcy event. Some of the ways that the companies do in order to survive are to merge with a larger company or to sell it to interested party.

Banking industry also faces the same problems. People who deposit their Dollars in the bank and want to withdraw their deposits will make the bank face a currency lost. Now, what if the Dollars that being withdrawn is in a large amount. The currency lost that they must face will significantly affect the financial reports. The currency lost that is faced by Indonesian banks has made a severe problem

and led a lot of banks liquidated, merged, or acquired. However, recent study finds that merging companies and or banks in the era of crisis are more likely to fail than to succeed. Another way to cover for companies and/or banks lost is to sell their assets in an auction.

The recession period has taught us the importance of the study of financial distress and its problem-solving alternatives. The studies are important because the writer believe that no company wants the event of bankruptcy to occur in their company. In order to survive in Indonesian economic environment, one must know the risk and the alternatives to solve the problem. A company must also have a constant attention on their financial reports because one can predict the health level of the company.

From that time, international and national economic literatures have been published in order to provide information about the management of a company when dealing with financial distress. There are several new approaches, techniques, models, and alternatives that have been proposed to help a company dealing with financial distress to help them to survive. Although some of them still need further research on the study, some of them already provide a sufficient data in general. The fact that the literatures still need future research means that the problem of financial distress continues to evolve. Continuous research is crucial in order to provide an up-to-date data to solve an up-to-date problem.

1.2 Problem Identification

The previous researches of predicting financial distress use a various tools of prediction. The most popular tools are provided by Altman (1968) with his *Z-Score*, Ohlson (1980) with his *O-Score*, and CAMEL ratios. From a research conducted by Begley, Ming, and Watts (1997) Ohlson's *O-Score* is found to be more powerful tool to predict bankruptcy. This statement is also approved by Koch (2002). But *O-Score* is not popular in Indonesia. The most popular tool is the formula of *Z-Score*. This formula contains several weaknesses that are considered severe in methodology. The uses of same amount of sample, the use of MDA, are the example of the weaknesses. Ohlson eliminated those weaknesses and create O-Score which is a more powerful tool to predict bankruptcy or financial distress. But the method is not popular because of its complexity.

1.3 Problem Formulation

The problem with Ohlson's *O-Score* is that the tool is constructed in a country different than Indonesia where the political and economical condition is different, which means the validity and reliability of the use of the tool in Indonesia is being questioned. That is why this research is conducted; to answer the following question:

"Can Ohlson's *O-Score* be used to predict financial distress of public listed firms in Indonesia?"

The answer to that question is crucial to be found because by answering the question the diversity of financial distress prediction tool will be more

comprehensive. Most of the researches that have been conducted by Indonesian researcher used Altman's *Z-Score* and CAMEL ratios. The use of Ohlson's *O-Score* is quite small.

1.4 Problem Limitation

This research is limited to predict the condition of financial distress of a company that is listed in Jakarta Stock Exchange and publish its financial statement summary in the Indonesian Capital Market Directory. To differentiate between financially distressed company and good performing company, the writer uses certain criteria. These criterions are taken from Almilia and Herdiningtyas (2005). They said that:

> Solvent banks are banks that didn't suffer loss in more than three years... The criterions of financially distressed company are bankrupt (Peraturan Pemerintah RI No.25 tahun 1999), have loss in three consecutive years (Surifah 2002:34), and have loss more than 75% of its capital (KUHD pasal 47 ayat 2)

But the later exploration finds no evidence of the event of bankrupcty that occurs in 2006. So, the writer used other definition of bankruptcy which is insolvent. The criterion of insolvent is that the firm can't fulfill its obligation because of financial distress. From that definition, the writer tried to search for a firm with the lost of more than its total assets which means if the company decide to close the firm, the firm will not have the sufficient assets to cover the loss. The problem is, such event is also not existed in 2006. So, the writer used other definition of bankruptcy which is delisting from Jakarta Stock Exchange. The reason for this criterion is that delisting an elimination form of firm's stock

activity. It means that when a firm is delisted, the stock of the firm cannot be traded anymore. So, the firm is virtually not existed anymore. It is said virtually because the company still exists but it does not exist in the stock exchange. The criteria also have to meet certain requisite. The company which is delisted have to be delisted because financial distress and not because the company merge or acquired or went private.

Other limitation of the research is that the data only used non-financial firms such as banks, insurance, securities, and other credit agencies other than bank. The limitation is based on the exclusion of these firms by Ohlson (1980). In his research, Ohlson excluded these firms because these firm has a different bankruptcy environment and structurally different than non-financial companies.

1.5 Research Objective

The objective of this research is to find out whether Ohlson's *O-Score* can be used to predict the condition of financial distress in Indonesia or not. As said before, Ohlson's *O-Score* was developed in a country that politically and economically is different so the validity of the use of the tool is still in question.

1.6 Research Contribution

1.6.1 Analyst

This research can be used by analyst of a firm. Analysts can use this research to find out whether Ohlson's *O-Score* is relevant to Indonesia's condition. If the answer of this research is that Ohlson's

O-Score can be used in Indonesia, so the analysts can use the tool to evaluate the condition of a certain company and even to predict a bankruptcy of a company.

1.6.2 Researchers

Researchers can use this research to find out more deeply about the use of Ohlson's *O-Score* in Indonesia. Researchers can find out the weakness of this research and conduct another research which the weakness of this research is erased.

1.6.3 Managers

A manager of a firm can also used the findings in this research in order to valuate the condition of the firm that they manage. They can find out whether the firm is in a distressed condition or in a solvent condition.

1.6.4 Investors

An investor can use the finding of this research in order to decide where the money is going to be allocated. In allocating money, especially in a big amount of money, one cannot invest without any consideration. The finding of this research can help the investors to valuate the healthiness of a firm and avoid having loss because of a poor choice of firm to be invested.

1.7 Definition of Terms

1.7.1 Financial Distress

Financial distress is a condition where a company failed to meet its contractual obligations (Shapiro and Balbirer, 2001).

1.7.2 Bankruptcy

Bankruptcy is a condition where a company failed to generate revenue in its operation activity. Bankruptcy is also known as liquidation, disclosure, or insolvability (Adnan and Kurniasih, 2000:137) Almilia and Herdiningtyas (2005) also define bankruptcy as a condition or situation where a company failed to meet its obligation to its debtor because the company suffer from fund shortage to run or continue its operation so it cannot generate profit.

1.7.3 *O-Score*

O-Score is a prediction tool that uses financial ratio to predict the bankruptcy of a firm in the next year (Ohlson, 1980).

1.7.4 Failure

Failure is defined as a condition where a company suffer loss or a condition where the operational profit is less than the operational expense. Failure probability can be defined as a measure to predict that in the future, the asset value of the company will worth less than

the future debt or that the company will have a negative net worth in the future (Hadad, Santoso, Besar, Rulina; 2004).

CHAPTER II
THEORITICAL REVIEW

2.1 Bankruptcy Prediction Model

2.1.1 Financial Ratios

Beaver (1966) has developed a technique in predicting bankruptcy. Beaver (1966) said that financial ratios can be used in predicting bankruptcy. The research is conducted by comparing the financial ratios of bankrupted and un-bankrupted firm. The result of the research is that the financial ratios of bankrupted firms are very different with the financial ratios of un-bankrupted firm starting from five years prior to the event of bankruptcy. The financial ratios that were used are cash flow, net income, debt-to-total assets, liquid assets-to-total assets, liquid assets-to-current debt, and turnover ratios.

Other research is done by Sinkey (1975). Sinkey analyzed 110 distressed commercial banks using MDA technique. The financial ratios that were used by Sinkey are liquidity, loan volume, loan quality, capital adequacy, efficiency, income source, and income usage. For liquidity, Sinkey used (cash + U.S. Treasury Sec.) divided by assets. For loan volume, Sinkey used loan divided by assets. For loan quality, Sinkey used provision for loan losses divided by operational expense. For capital adequacy, Sinkey used loans divided by (capital + reserve). For efficiency, Sinkey used operating expense divided by operating income. For income source, Sinkey used loan revenue divided by total revenue, U.S. treasury securities revenue divided by total revenue, and state and local obligations revenue divided by total revenue. For income usage, Sinkey used

interest paid on deposits divided by total revenue, and other expenses divided by total revenue. The result of Sinkey's research is that the distressed bank is mostly caused by inefficiency in their operation. Other result is that the financial ratios between distressed and solvent banks are different.

Other Indonesian research is done by Hadad, Santoso, and Sarwedi (2004). In their research, they used capital ratios, financial ratios, and time variation, which is a dummy variable. The capital ratios that they used are capital to deposits, equity to deposits, loans to deposits, loans to equity, loans to capital, fixed assets to equity, fixed assets to capital, equity capital to total assets, return on equity, and retune on capital. The financial ratios that they used are liquidity risk which is (liquid assets – short term borrowing) to total deposits, capital risk which is equity to risk assets (assets – cash – BI demand deposits – government bond), credit risk which is classified productive assets to productive assets, deposit risk which is equity to total deposits, off-balanced sheet risk which is loan commitment to fee income, loans to assets, treasury securities to assets, other securities to assets, capital to assets, core deposits to total liabilities, and NPL ratio which is non-performing loans to total loans. The time variation variable is a dummy variable where the value is 1 if the period is the crisis period or after July 1997 and 0 if the period is prior of the crisis or before July 1997. The data that they used is the data of commercial banks in Indonesia in the period of January 1995 to December 2003. The prediction models that construct are divided into three sections, three months prior (MP3), six months (MP6), and 12 months (MP12). The result that they find is that only MP3 that can be used as a prediction

model where the accuracy is 94.9% when the default cut-off is 0.5 and 82.6% when the default cut-off is 0.939.

2.1.2 Altman's *Z-Score*

The first well-known formulation of bankruptcy prediction is developed by Altman (1968). Altman conducted a research about the use of financial ratios in predicting bankruptcy. The financial ratios that he used were working capital/total assets, retained earnings/total assets, EBIT/total assets, market value equity/book value of total debt, and sales/total sales. These financial ratios were composed by Altman into a formula which can predict bankruptcy. The formula is Zi = 1.2 WC/TA + 1.4 RE/TA + 3.3 EBIT/TA + 0.6 MVE/BUD + 1.0 S/TA. But in 1984 Altman re-conduct the research and developed an internationalized formula. The internationalized formula is Zi = 0.717 WC/TA + 0.847 RE/TA + 3.107 EBIT/TA + 0.420 MVE/BUD + 0.998 S/TA. From the result of the formulation of this formula, there are several criteria to categorize a condition of a firm based on its *Z-Score*. Firm with a *Z-Score* of less or equal to 1.81 means that the firm is much likely to be bankrupt or having a major risk of bankruptcy. Firm with a *Z-Score* ranging from 1.81 to 2.99 means that the firm is in a grey area which means that the firm is in a financial distress and if the problem is not resolved immediately, the firm will go bankrupt. Firm with *Z-Score* more than 1.99 means that the firm is in a healthy condition. The problem with the Altman's research is that he used the same number of sample in the different category. Palepu (1986) said that this methodology is not correct. Other problem is that Altman used Multiple

Discriminant Analysis (MDA) which based only on ordinal ranking. Ohlson (1980) said that it is probably insufficient to give explanation.

The implementation of Altman *Z-Score* in Indonesia is done by Adnan and Taufiq (2001). The research is done by estimating the *Z-Score* of 25 liquidated banks and 25 solvent banks in the period of 1997-2001. The data is taken from bank's financial statement that available in banking directory for book year 1993, 1994, 1995, 1996, and 1997. The researchers also take another data from Bank Indonesia, Capital Market Directory, Majalah Jurnal Pasar Modal, Majalah Info Bank, Jakarta Stock Exchange, and other relevant sources. The result of the research shows that Altman *Z-Score* is relevant to explain the occurrence of bankruptcy in Indonesia. The *Z-Score* of bankrupted banks and solvent banks is different. But according to Palepu (1986), the use of the same number of sample in different category is unacceptable. This is the weakness of the research done by Adnan and Taufiq (2001).

2.1.3 Merton Model

Other well known analysis is the Merton model which is a modification of Black-Scholes-Merton framework that developed by Crosbie and Bohn (2002) (in Hadad, Santoso, Besar, Rulina; 2004). Hadad, Santoso, Besar, and Rulina (2004) explain that the model estimates the default probability in three steps. First is to estimate assets market value, assets value volatility, equity volatility and debt book value using Merton approach. Second, distance to default is counted by using assets market value and its volatility. Third is the establishment of the

distribution of distance to flight from over 250.000 firm data and more than 4.700 default occurrence. The model has already been tested in UK by Marx Tudella and Young (2003). The result of their research finds that the default probability of the Merton model is good enough to explain bankrupted and solvent firms.

In Indonesia, the implementation of the Merton model is done by Hadad, Santoso, Besar, and Rulina (2004). In their research they used the replica of the Merton model which is used by Marx Tudela and Gary Young (2003) to estimate the probability of default in Indonesia. The data that they used is taken from Bloomberg and Jakarta Stock Exchange in the period of 1996-2003. Bloomberg data is used to measure the market value of assets while the Jakarta Stock Exchange data is used to estimates the information about the equity of the firm. The result of the analysis is that the Merton model works or relevant in Indonesia. The Merton model can be used as a precedence signal of default especially in the form of credit risk. The model can also differentiate between bankrupt and solvent firms.

2.1.4 CAMEL Ratios

The use of CAMEL ratios is done by Thomson (1991). The research is done by using the data of 770 bankrupted banks and 1.736 solvent banks for the period of 1984-1989. Thomson not only used CAMEL ratios as the independent variable, but Thomson also used variables that related with economic decision and condition. The CAMEL ratios that Thomson used are Capital adequacy, Assets quality, Management, Earnings, and Liquidity. Capital adequacy ratio is measured

by (book equity capital + reserve for loan and lease -/- the sum of loans +0 past due but still accruing and non-accruing loans) divided by total assets. Assets quality ratios are measured by net charge-off divided by total loans, loan portfolio Herfindahl index, and net loans and lease divided by total assets. Management ratios are measured by overhead divided by total assets, and loans to insiders divided by total assets. Earnings ratio is measured by earning after tax divided by total assets. Liquidity ratio is measured by non-deposits liabilities divided by cash and investment securities. For variables that related to economic decision, Thomson used dummy variable where the value is 1 if the state is banking state and 0 if otherwise, dummy variable where the value is 1 if the bank is a holding company and 0 if otherwise, natural log of total assets, and natural log of average deposits per banking office. For variable that related to economic condition, Thomson used measure of economic diversification, unemployment rate, growth in personal income, and business failure rate. The result of the research shows that CAMEL ratios can be used as an early warning to bankruptcy. The variable that related to economic condition also serve as a predictor in bankruptcy while the variable that related to decision are not quite accurate except or the natural log of total assets.

Other study of bankruptcy prediction in Indonesia has also conducted by Wilopo (2001). In his paper, he conducted the study using CAMEL ratios that published by bank annually. He used samples of banks that liquidated during the recession from November 1997 until March 1999. His results are that CAMEL ratios can provide 80-90% accuracy in predicting bankruptcy. The low accuracy is

caused by the error that happens in Indonesia. The decision to close banks was stated for banks that had not to be liquidated (error type 1). Other factors is that the factors outside CAMEL ratios like economic condition (economy growth, unemployment rate, inflation, etc) and political parameters can not be used in this research because of the measurement difficulties. If these factors can be measured precisely, the study will have a more accurate result. Other weaknesses in Wilopo's study is that the examination period used is only one year prior November 1997 liquidation and two years prior March 1999 liquidation. If the use of longer examination period is implemented with financial information that is closer to liquidation announcement, so the result of the study might achieve a better rate of bank bankruptcy prediction.

Other research is done by Luciana Spica Almilia and Winny Herdiningtyas (2005). In their journal, they use purposive sampling method which is a sampling method that took sample in a certain amount from the population with a certain criteria (Sugiyono 1999). The criteria that they use are national private banks that publish financial statement in 2000-2002; their total assets are 100 millions – 37 billions in december 31st. Their samples are divided in two, banks that have problems and banks without problems. According to them, banks without problem are banks that were not in banking medical program and not under special surveillance and still operating until December 31st 2004; and the banks didn't suffer loss in 2000-2003. While banks with problems are banks that declared bankrupt or closed by central bank in April 8th 2004 (Peraturan Pemerintah RI No.25 tahun 1999), banks that suffer loss in three consecutive years (2000-2003)

(Surifah 2002), and banks that suffer loss more than 75% of capital in 2000-2003 (KUHD pasal 47 ayat 2). Their result is that CAR, APB, NPL, PPAPAP, ROA, NIM, and BOPO can be used in predicting banks bankruptcy. The weakness of this study is that other aspect according to Bank Indonesia adjacent to Surat Edaran Bank Indonesia Nomor 3/30/DPNP dated December 14th 2001 which is Compliance that consists of BMPK Violation Percentage, BMPK Excess Percentage, Rupiah GWM and PDN is still not used so the whole aspect that sourced from Bank Indonesia is incomplete. Other weakness is that some of the financial ratios that stated in Bank Indonesia directory is not coherent with the calculation of financial ratios that calculated based on its accounts or formulas from the existing theory, this problem stated that audited financial statement is not coherent with the account of the financial statement (Almilia and Herdiningtyas 2005).

Other implementation CAMEL ratios in Indonesia is done by Nasser and Aryati (2000) (in Almilia and Herdiningtyas, 2005). The ratios that they used are CAR1, CAR2, ETA, RORA, ALR, NPM, OPM, ROA, ROE, BOPO, PBTA, EATAR, and LDR. The data that they used are go public banks. The methods that they used are stepwise statistic and casewise statistic. The result of their research shows that the most significant variable to predict financial distress is EATAR and OPM.

Surifah (1999) also have tested the implementation of the use of CAMEL ratio in Indonesia. The variables that Surifah use is the CAMEL ratios based on SE BI no.30/11/KEP/DIR 30 April 1997. The data that Surifah used are 26

bankrupted banks and 26 solvent banks in the period of 1993-1997. The result of the research indicates that CAMEL ratios can be used as an early warning of bank's bankruptcy. The research indicates a bigger average number of the ratios that included in CAMEL ratios. The weakness of the research is that Surifah used the same number of sample in different category which is methodologically incorrect (Palepu 1976). Other weakness is that Surifah did not differentiate between estimation sample and validation sample to test the prediction power (Foster, 1986).

2.1.5 Ohlson's *O-Score*

The problems of Altman's Z-Score were eliminated by Ohlson (1980) which used conditional logit analysis to eliminate the weaknesses of MDA. In Ohlson's (1980) research, Ohlson has described in detail the weaknesses of MDA technique. Ohlson (1980) said:

> (i) There are certain statistical requirements imposed on the distributional properties of the predictors...A violation of these condition, it could perhaps be argued, is unimportant...if the only purpose of the model is to develop a discriminating device. Although this may be a valid point, it is nevertheless clear that this perspective limits the scope of the investigation. (*ii*) The output of the application of an MDA model is a score which has little intuitive interpretation, since it is basically an ordinal ranking (discriminatory) device...If, however, prior probabilistics of the two groups are specified, then it is possible to derive posterior probabilities of failure. But this Bayesian revision process will be invalid or lead to poor approximations unless the assumptions of normality, etc. are satisfied. (*iii*) There are also certain problems related to the "matching" procedures which have typically been used in MDA. Failed and nonfailed firms are matched according to criteria such as size and industry, and these tend to be somewhat arbitrary... (Ohlson, 1980)

Ohlson (1980) also eliminate the weakness of the use of the same number of sample in different category. Ohlson (1980) used the data of 105 bankrupted firms and 2.058 un-bankrupted firms in the period of 1970-1976. The financial ratios that used by Ohlson is also different with Altman's. Ohlson used size {log (total assets/GNP price level index)}, total liabilities/total assets, working capital/total assets, current liabilities/current assets, net income/total assets, operational funds/total liabilities, dummy variable (1 if net income < 0 for the last two years; 0 otherwise), dummy variable (1 if total liabilities > total assets; o otherwise), (net income $_t$ - net income $_{t-1}$)/(net income $_t$ + net income $_{t-1}$). From those financial ratios, Ohlson constructed the formula of:

$$O - Score = \left[1 + \exp\left(-Y_{jt}\right)\right]^{-1} \text{ where}$$

$$Y_{jt} = \alpha + \beta_1 SIZE_{jt} + \beta_2 TLTA_{jt} + \beta_3 WCTA_{jt} + \beta_4 CLCA_{jt} + \beta_5 NITA_{jt} + \beta_6 FUTL_{jt} + \beta_7 INTWO_{jt} + \beta_8 OENEG_{jt} + \beta_9 CHIN_{jt} + \varepsilon$$

In the formula, SIZE is the natural log of total assets divided by GNP price level index. TLTA is the total liabilities divided by total assets. WCTA is the working capital divided by total assets. CLCA is the current liabilities divided by current assets. NITA is the net income divided by total assets. FUTL is the operational funds divided by total liabilities, INTWO is a dummy variable where the value is 1 if the net income for the last two years is negative and 0 other wise. OENEG is a dummy variable where the value is 1 if total liabilities are bigger than total assets and 0 otherwise. CHIN is net income for year t subtracted by net income for year t_{-1} divided by the sum of absolute value of net income for year t plus the absolute value for net income for year t_{-1}.

The coefficient signing for the variables are positive for TLTA, CLCA and ITWO and negative for SIZE, WCTA, NITA, FUTL, and CHIN while OENEG is indeterminate. This signing, Ohlson said, is based on previous studies, "common sense", and theory. Ohlson result shows that the coefficient signing is correct. The result shows that OENEG has a negative coefficient. The result of Ohlson's research indicates that the most significant variable to predict the failure of a firm is SIZE, TLTA, NITA and/or FUTL, and WCTA or WCTA and CLCA jointly.

Adam S. Koch (2002) has done a research about the relation between financial distress, bias in forecasting, and the credibility of voluntary earnings forecast made by the management. The management forecast errors is measured by:

$$MFE_{it} = \frac{EPS_{it} - MF_{it}}{P_i}$$

where MFE_{it} is the management forecast error, EPS_{it} is the actual realized EPS, MF_{it} is the management's EPS forecast for firm *i*, and P_i is the share price of the firm on the first day of the fiscal year in which the management earning forecast is made. To measure the analyst forecast revision and forecast deviation, Koch used:

$$AFR_{it} = \frac{SFAF_{it} - PFAF_{it}}{P_i} \qquad FD_{it} = \frac{MF_{it} - PFAF_{it}}{P_i}$$

where AFR_{it} is the analyst forecast revision, $SFAF_{it}$ is the consensus analyst forecast subsequent to management earnings forecast, $PFAF_{is}$ is the consensus analyst forecast prior to management's earning forecast, and FD_{it} is the forecast deviation. In estimating financial distress, Koch used Ohlson's formula of *O-Score*. The samples that were used are 517 quantitative management forecasts of annual

and quarterly EPS issued between 1993 and August 1997. The result of the research is:

> ...forecast in excess of current analyst expectation that issued by distressed firms show greater upward bias. Other result is that analyst forecast revisions surrounding the release of management forecast in excess of current expectations become less positive as financial distress intensifies. Other result is that analyst forecast revision surrounding the release of management forecast below analyst' existing expectation become more negative as financial distress intensifies. Koch (2002)

2.1.6 Other Researches

Other research is done by Hillegeist, Keating, Cram, and Lundstedt (2002). Their research is quite unique because they compared Altman's *Z-Score*, Ohlson's *O-Score*-which are an accounting-based measure-and BSM-PB (Black-Scholes-Merton – Probability of Bankruptcy) which is a market-based measure. Their research used the data of 65.960 firms including 516 events of bankruptcy in the period of 1979-1997. The methodology of the research used a discrete hazard model produced unbiased coefficient estimates. The result of the result indicates that the two scores are insufficient in predicting bankruptcy although that the two scores have significant and incremental information. They said that BSM-PB has more "explanatory power" compared with the two scores but it is also insufficient statistic. They said:

> BSM-PB does not reflect all available market-based information regarding PB. Specifically, excess return and relative market size provide incremental information (Hillegeist, Keating, Cram, and Lundstedt; 2002).

Another bankruptcy-predicting technique is discussed by Hui Hao. A PhD student in Queen's School of Business in her paper *Predicting Bankruptcy: A New*

Structural Approach (2005). In the paper, she estimated the probability of bankruptcy 267 unique bankrupt firms and 2531 unique non-bankrupt firms from 1996-2000 in a model where common equity is viewed as a down and out call option on a firm's assets. She compare her study with three other popular approaches; Altman (1968), Shumway (2001), and Merton/KMV. Accuracy of the study is measured by the percentage of bankruptcies that are classified into the highest deciles within each mode (ranking) and the Area Under the Curve (AUC). Based on ranking contest and magnitude of AUC structural models (the barrier option approach and Merton/KMV) have better accuracy than statistical models (Altman (1968) and Shumway (2001)) with one year prior to bankruptcy data and vice versa three years prior to bankruptcy.

2.2 Hypothesis Formulation

This study analyzes about the effectiveness of the use of Ohlson's *O-Score* in predicting financial distress of listed firms in the period of 2004 and 2005. Previous research done by Koch (2002) stated that Ohlson's *O-Score* is a stronger prediction tools compared with other prediction tools. It is stronger because it the development of the formula is using the right analytical tools and the right methodological analysis. But the problem is that the tool is formulated in foreign country where the economic and political conditions are different with Indonesia.

2.2.1 Major Hypothesis

The major hypothesis is developed to analyze the use of *O-Score* in predicting financial distress in Indonesian listed firms. Ohlson (1980) has developed a formula to predict bankruptcy in the nest year. Based on that research, the writer wants to investigate whether Ohlson's (1980) is relevant to the condition of Indonesian economic

Ha: O-Score can be used to predict financial distress in Indonesian public listed firms.

2.2.2 Minor Hypothesis

The minor hypothesis is developed to analyze the positive influence of partial variables that are used in *O-Score* to predict financial distress in public listed firms in Indonesia. In Ohlson's (1980) research, he finds that partial of the variables that he used in developing the formula has a significant difference between the bankrupt and solvent banks. Ohlson's research indicates that the most significant variable to predict the failure of a firm is SIZE, TLTA, NITA and/or FUTL, and WCTA or WCTA and CLCA jointly. The minor hypothesis is developed whether those variables also significantly lower the *O-Score*.

H_1: log(total assets) has a positive influence in predicting financial distress

H_2: (Total Liabilities/Total Assets) has a positive influence in predicting financial distress

H_3: (Net Income/Total Assets) and/or (Operating Fund/Total Liabilities) has positive influence in predicting financial distress

H_4: (Working Capital/Total Assets) or (Working Capital/Total Assets) and (Current Liabilities/Current Assets) jointly have positive influence in predicting financial distress

CHAPTER III
RESEARCH METHOD

3.1 Population and Sample

This research is done by not taking sample of the population. This research is done by analyzing the whole population of the data to create a better and accurate result. The population of the research is the data of financially distressed firms that listed in Jakarta Stock Exchange and publish its financial statement in the Indonesian Capital Market Directory year 2006. The classifications of the financially distressed firms are taken from the research of Almilia and Herdiningtyas (2005). In their research the classified financially distressed firms as bankrupt (Peraturan Pemerintah RI No.25 tahun 1999), have loss in three consecutive years (Surifah. 2002), and have loss more than 75% of its capital (KUHD pasal 47 ayat 2). The solvent firms are classified as having profit in three consecutive years (2003-2005).

As explained before, the later exploration finds no evidence of the event of bankruptcy that occurs in 2006. So, the writer used other definition of bankruptcy which is delisting from Jakarta Stock Exchange. There are some criterions that must be fulfilled in order a delisting occurrence. The criterions used are only the criterions that correlated with financial distress. The criterions are have loss in three consecutive years or have loss more than 50% of its capital, and didn't pay cash dividend in three consecutive years.

So, the final population of the research is 41 distressed firms that consist of 36 firms that have loss in three consecutive years (2003-2005), one delisted firms

because of financial distress and have loss more than 75% of its capital, and 4 firms that have loss more than 75% of its capital. The population of solvent firms is 138 firms.

These data is going to be analyzed using the formula of Ohlson's (1980) *O-Score*. The formula consists of 9 variables which each have its own coefficient. Those variables are SIZE which is the natural log of total assets divided by GNP price level index. But since the data of GNP price level index is not available, the writer modified the formula into only the natural log of the total assets. TLTA is the total liabilities divided by total assets. WCTA is the working capital divided by total assets. CLCA is the current liabilities divided by current assets. NITA is the net income divided by total assets. FUTL is the operational funds divided by total liabilities, INTWO is a dummy variable where the value is 1 if the net income for the last two years is negative and 0 other wise. OENEG is a dummy variable where the value is 1 if total liabilities are bigger than total assets and 0 otherwise. CHIN is net income for year t subtracted by net income for year t_{-1} divided by the sum of absolute value of net income for year t plus the absolute value for net income for year t_{-1}.

3.2 Research Setting

The data that were used in the research is all secondary data, meaning that the data used is taken not directly from the source of the data but it is already published by other. The data was taken from the financial statement of all public listed firms

that published its financial statement in the Indonesian Capital Market Directory 2006.

3.3 Instrumentation

In this research, the writer will not use validity and reliability test. The reason behind this act is because the data used is not a sample data but a population data. Validity and reliability test is only taken when the data is a sample test. Validity and reliability test is taken to analyzed whether the sample that were taken from the population is representative enough. But because the data used is not a sample, the data will be very representative because population data cover the entire research subject.

3.4 Technique of Data Analysis

The analysis of data will be done using the formula of O-score that developed by James Ohlson (1980) in his research "Financial Ratios and the Probabilistic Prediction of Bankruptcy". In this research, Ohlson developed a formula of predicting bankruptcy one year prior the event of bankruptcy. The accuracy of this prediction model is 96.3% for the whole variables. The formula that Ohlson developed is:

$$O - Score = \left[1 + \exp\left(-Y_{jt}\right)\right]^{-1} \text{ where}$$

$$Y_{jt} = \alpha + \beta_1 SIZE_{jt} + \beta_2 TLTA_{jt} + \beta_3 WCTA_{jt} + \beta_4 CLCA_{jt} + \beta_5 NITA_{jt} + \beta_6 FUTL_{jt} + \beta_7 INTWO_{jt} + \beta_8 OENEG_{jt} + \beta_9 CHIN_{jt} + \varepsilon$$

- SIZE = log(total assets)
- $\text{TLTA} = \frac{\text{Total Liability}}{\text{Total Assets}}$
- $\text{WCTA} = \frac{\text{Working Capital}}{\text{Total Assets}}$
- $\text{CLCA} = \frac{\text{Current Liability}}{\text{Current Assets}}$
- OENEG = one if total liabilities more that total assets, zero otherwise
- $\text{NITA} = \frac{\text{Net Income}}{\text{Total Assets}}$
- $\text{FUTL} = \frac{\text{Operational Fund}}{\text{Total Liability}}$
- INTWO = one if net income was negative for the last two years, zero otherwise
- $\text{CHIN} = \frac{(NI_t - NI_{t-1})}{(|NI_t| + |NI_{t-1}|)}$ where NI is the net income of the firm in the most recent year

CHAPTER IV
RESEARCH FINDINGS, DISCUSSION, AND IMPLICATION

4.1 Research Description

4.1.1 Preparation of Research

Before conducting the research, the writer has studied a number of journals, books, and other articles in relation with the research. The data needed are taken from the financial statement that is published in the Indonesian Capital Market Directory 2006. From all the data available in the Indonesian Capital Market Directory, the writer filtered the data with some criterions to meet the objective of the research. As said before, the objective of the study is to find out whether the formula of Ohlson's (1980) *O-Score* can be used in Indonesia. To meet with the objective, the writer differentiates the data into two groups which is financially distressed and solvent firms.

To be classified into a financially distressed firm, it should meet certain requisites. The requisites used are:

a. The company must publish its summary of financial statement in the Indonesian Capital Market Directory 2006.
b. The company must have loss in minimum three consecutive years. To meet with the objective of the research, the writer set a rule that the loss occurs in year 2003-2005.
c. The company must have loss more than 75% of its capital in the year of 2004 or 2005.

d. The company must be delisted from the Jakarta Stock Exchange because of financial distress and not because other factors such as merger, acquisition, privatization, conduct illegal business, or wrong auditing method. To be clear, the criterions of delisting action by Jakarta Stock Exchange will be attached in the appendices.

The criterion for solvent firms is that the firm didn't have loss in three consecutive years (Almilia and Herdiningtyas, 2005).

From the criterions above, the final population of the financially distressed firm in the year 2004-2005 is 41 firms, consist of 36 firms with three consecutive years of loss, 4 firms with a loss more than 75% of its capital, and 1 delisted firm because of financial distress (have loss more than 50% of its capital and not pay cash dividend in three consecutive years).

4.1.2 Research Process

.All of the data above were obtained from Indonesian Capital Market Directory 2006 that have already filtered with some criterions of financial distress definition and resulted with 138 solvent firms and 41 distressed firms that consist from 36 firms with three consecutive years of loss, 4 firm with a loss more than 75% of its capital, and 1 delisted firm because of financial distress (have loss more than 50% of its capital and not pay cash dividend in three consecutive years), is going to be analyzed using logit regression method of Ohlson's (1980) *O-Score*.

The formula of Ohlson *O-Score* is:

$$O - Score = \left[1 + \exp\left(-Y_{jt}\right)\right]^{-1} \text{ where}$$

$$Y_{jt} = \alpha + \beta_1 SIZE_{jt} + \beta_2 TLTA_{jt} + \beta_3 WCTA_{jt} + \beta_4 CLCA_{jt} + \beta_5 NITA_{jt} + \beta_6 FUTL_{jt} + \beta_7 INTWO_{jt} + \beta_8 OENEG_{jt} + \beta_9 CHIN_{jt} + \varepsilon$$

In the formula, SIZE is the natural log of total assets divided by GNP price level index. But because the data of GNP price level index is not available in Indonesia, the formula of SIZE is modified into only the natural log of the total assets. TLTA is the total liabilities divided by total assets. WCTA is the working capital divided by total assets. CLCA is the current liabilities divided by current assets. NITA is the net income divided by total assets. FUTL is the operational funds divided by total liabilities, INTWO is a dummy variable where the value is 1 if the net income for the last two years is negative and 0 other wise. OENEG is a dummy variable where the value is 1 if total liabilities are bigger than total assets and 0 otherwise. CHIN is net income for year t subtracted by net income for year t_{-1} divided by the sum of absolute value of net income for year t plus the absolute value for net income for year t_{-1}.

In this research, validity and reliability test is not going to be used. The reason why validity and reliability test is not conducted is because the data used is not a sample of population. The data used in the research is the data of the whole population. Validity and reliability test is only taken when the data of the research is a sample of a population. The objective of validity and reliability test is to find out whether the sample that was taken from the population has already enough to represent the whole population. For example, if the population of the research is

consist of four hundreds firms, means that the sample can't be just only ten because it will not represent the whole population. Validity and reliability test is taken to investigate whether the amount of sample that were taken is already enough to represent the whole population.

4.2 Research Findings

4.2.1 Statistical Description

The descriptive statistic is often used to analyze the central tendency and dispersion measurement of a research data. Form descriptive statistic, central tendency information can be obtained from information such as mean, and median. The mean shows the average value of the data contained in each variable. The median indicates the value of the data located exactly in the middle. The information of dispersion measurement can be obtained from the information of standard deviation.

The descriptive statistics that explain the descriptive statistic information about the research is presented in table 4.2. From the table below, the highest value of central tendency central tendency measurement is owned by SIZE while the lowest is owned by FUTL. The highest value of dispersion measurement is owned by FUTL and the lowest is owned by NITA.

Table 4.1

Descriptive Statistics Table

	Y	SIZE	TLTA	WCTA	CLCA	OENEG	NITA
Mean	0.22905	5.837211	0.582818	0.063066	1.343166	0.078212	0.027931
Median	0	5.80841	0.49927	0.153036	0.652614	0	0.036292
Maximum	1	7.793588	4.010308	0.72191	34.80266	1	1.139443
Minimum	0	3.923348	0.000434	-6.68277	0.001793	0	-1.26182
Std. Dev.	0.42081	0.702442	0.543375	0.651952	3.24356	0.268881	0.165706
Skewness	1.289556	0.162396	3.699493	-5.8952	6.793666	3.141745	-1.0645
Kurtosis	2.662955	2.78648	20.11054	52.17018	57.27937	10.87056	24.22247
Jarque-Bera	100.9175	2.25362	5183.776	38137.75	46702.09	1512.968	6785.978
Probability	0	0.324065	0	0	0	0	0
Observations	358	358	358	358	358	358	358

	FUTL	INTWO	CHIN
Mean	-1.04171	0.212291	0.022498
Median	0.145035	0	0.047703
Maximum	2.3901	1	1
Minimum	-412.721	0	-1.81716
Std. Dev.	21.87833	0.409502	0.414019
Skewness	-18.6928	1.407135	-0.53612
Kurtosis	352.1537	2.98003	4.134013
Jarque-Bera	1839314	118.1477	36.33252
Probability	0	0	0
Observations	358	358	358

4.2.2 Logistic Regression Result

The finding of the research indicates that the formula of Ohlson's *O-Score* can be used to predict financial distressed in go-public firms in Indonesia during the period of 2004-2005. The conclusion is derived from the regression result which shows the P value of the combined data of the research data. The P value must have a value of less than 0.1 if the hypothesis is accepted. Meaning that

variables which have P value of less than 0.1, have a significant effect in predicting financial distress in go-public firms in Indonesia during the period of 2004-2005.

Table 4.2

Regression result of O-Score

Dependent Variable: Y
Method: ML - Binary Logit
Date: 04/25/07 Time: 15:40
Sample: 1 358
Included observations: 358
Convergence achieved after 21 iterations
QML (Huber/White) standard errors & covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-308.5979	7.586096	-40.67941	0.0000
SIZE	36.69856	0.945957	38.79515	0.0000
TLTA	13.66607	1.612529	8.474926	0.0000
WCTA	-12.78383	1.042798	-12.25916	0.0000
CLCA	-17.81095	1.442520	-12.34711	0.0000
OENEG	250.4892	5.881012	42.59288	0.0000
NITA	-18.81291	0.837284	-22.46898	0.0000
FUTL	-288.4213	6.423042	-44.90416	0.0000
INTWO	444.5004	47.31972	9.393555	0.0000
CHIN	126.7821	2.893932	43.80964	0.0000

Mean dependent var	0.229050	S.D. dependent var	0.420810
S.E. of regression	5.29E-05	Akaike info criterion	0.055876
Sum squared resid	9.74E-07	Schwarz criterion	0.164271
Log likelihood	-0.001845	Hannan-Quinn criter.	0.098985
Restr. log likelihood	-192.6492	Avg. log likelihood	-5.15E-06
LR statistic (9 df)	385.2947	McFadden R-squared	0.999990
Probability(LR stat)	0.000000		
Obs with Dep=0	276	Total obs	358
Obs with Dep=1	82		

The calculation of the formula also indicated the ability of Ohlson's *O-Score* in predicting financial distress in Indonesia. The result of the *O-Score* calculation shows a significant difference in solvent and distressed firms. The calculation shows that all of the data used have the O-Score of more than the original cut-off point which is 0.038. In Ohlson (1980) research, the cut-off point of 0.038 is chosen because it lowered the combined total of misclassification errors among the samples.

4.2.3 Expectation-Prediction Result

Table 4.3

Expectation-Prediction Table

Dependent Variable: Y
Method: ML - Binary Logit
Date: 04/25/07 Time: 15:40
Sample: 1 358
Included observations: 358
Prediction Evaluation (success cutoff C = 0.5)

	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
P(Dep=1)<=C	276	0	276	276	82	358
P(Dep=1)>C	0	82	82	0	0	0
Total	276	82	358	276	82	358
Correct	276	82	358	276	0	276
% Correct	100.00	100.00	100.00	100.00	0.00	77.09
% Incorrect	0.00	0.00	0.00	0.00	100.00	22.91
Total Gain*	0.00	100.00	22.91			
Percent Gain**	NA	100.00	100.00			
	Estimated Equation			Constant Probability		
	Dep=0	Dep=1	Total	Dep=0	Dep=1	Total
E(# of Dep=0)	276.00	0.00	276.00	212.78	63.22	276.00
E(# of Dep=1)	0.00	82.00	82.00	63.22	18.78	82.00
Total	276.00	82.00	358.00	276.00	82.00	358.00
Correct	276.00	82.00	358.00	212.78	18.78	231.56
% Correct	100.00	100.00	100.00	77.09	22.91	64.68
% Incorrect	0.00	0.00	0.00	22.91	77.09	35.32
Total Gain*	22.90	77.09	35.32			
Percent Gain**	100.00	100.00	100.00			

*Change in "% Correct" from default (constant probability) specification
**Percent of incorrect (default) prediction corrected by equation

From the prediction table presented above, it can be seen that the accuracy of all variable used in *O-Score* is correct for 100%. It means that the variables used in *O-Score* are more fitted to be used in Indonesia compared to the original country where the formula is developed. The prediction result in the country where the formula is developed is below the prediction result in this research. This research

shows the accuracy of prediction of 100% while the original research by Ohlson (1980) only shows an accuracy of 96.3%.

4.2.4 O-Score Calculation Result

The result in the calculation of the O-Score shows a very significant difference between the solvent firms and distressed firms. But there is a problem in the calculation of the formula. Two of the firm can not be calculated its *O-Score* because the Yjt has the value of less than -750 which cannot be calculated using the formula. But other than that, the result shows that Ohlson's *O-Score* formula can be used in predicting financial distress in Indonesia. The detailed result of this calculation will be shown in the appendices

4.2.5 Hypotheses Test result

. From the table 4.2 the hypothesis developed in the previous chapter can be analyzed as follow:

- **Ha: O-Score can be used to predict financial distress in Indonesian public listed firms.**

  The Ha which is the major hypothesis is accepted because the overall result of the variables has the P value less than 0.1 which indicates its significance in predicting financial distress in go-public firms in Indonesia during the period of 2004-2005.

- **H_1: log(total assets) has a positive influence in predicting financial distress**

  Other hypothesis is H_1 is also accepted because the coefficient value of SIZE is positive. It means that the bigger the firm size, the bigger the risk of financial distress. This result contradicts with the original result of Ohlson (1980) which has the coefficient value of SIZE negative. The possible reason behind this difference is because in Indonesia, the owner of the firm may sometimes expand the firm recklessly. The owner of the firm may not pay much attention in the expansion risk while expanding their business.

- **H_2: (Total Liabilities/Total Assets) has a positive influence in predicting financial distress**

  TLTA has also has a positive influence in predicting financial distress. It means that the bigger the ratio between the total liabilities and the total assets, the bigger the risk of financial distress it may face. The result is consistent with the result of the original *O-Score* developed by Ohlson (1980).

- **H_3: (Net Income/Total Assets) and/or (Operating Fund/Total Liabilities) has positive influence in predicting financial distress**

  H_3 is rejected because the coefficient value of NITA and/or FUTL has a negative value. It means that the bigger the ratio between Net Income and Total Asset and/or the ratio between Operational Fund and Total liabilities,

the less risk of financial distress the firm may face. The fact that the coefficient value of NITA and/or FUTL has a negative value, it means it has a negative effect on financial distress. The bigger the value of those variables, the smaller the risk of financial distress.

- **H_4: (Working Capital/Total Assets) or (Working Capital/Total Assets) and (Current Liabilities/Current Assets) jointly have positive influence in predicting financial distress**

  The last hypothesis is also rejected because the value of the coefficient of WCTA and CLCA has a negative value. It means the bigger the ratio between Working Capital and Total Assets and the ratio between Current Liabilities and Current Assets, the less risk of financial distress the firm may face. Because the value of WCTA and CLCA has a negative value, it means that it has a negative effect on financial distress. The bigger the value of those variables, the smaller the risk of financial distress.

From the logistic regression table, it can be seen that the variables that have the most significant effect in predicting financial distress are OENEG, FUTL, INTWO, and CHIN. In the original Ohlson (1980) research, the most significant variable to predict bankruptcy are SIZE, TLTA, NITA and/or FUTL, and WCTA or WCTA and CLCA jointly.

4.3 Implications

The result of the research indicates that the formula developed by Ohlson (1980) is also relevant to the condition in Indonesia. Although the formula is developed in a different country where the economic and political condition is different, the formula is able to predict financial distress in Indonesia. As long as we follow the rules of Ohlson (1980) in calculating the *O-Score* like excluding financial firms, we will get a good result of *O-Score*.

The result of the research can be used as a formula to predict financial distress in Indonesia. The parties who might need this kind of information are firm's analyst, firm's manager, external investors, and other researcher. Firm's analysts need the information to advice the manager if the company has a high *O-Score*. The analysts can advice the manager of the firm when the *O-Score* of the firm had close to the cut-off point which is 0.038.

The manager of the firm needs this information to make a strategy of recovery when the *O-Score* of the company has reach or close to 0.038. When the company has high *O-Score*, the manager needs to create a turnover in the company. The manager has the responsibility to make the company healthy again. The strategy of recovery also must be maintained if the company doesn't want to be financially distressed again.

External investors need this kind of information when deciding which company they will invest. When deciding to invest, an investor must carefully select the company where the money is going to be invested. If the investor is not careful, they might put their money in a distressed firm or companies that have a

high *O-Score*. So the result of this research can be used as one of the weighing tool for investors to select which company they will put their money to.

The result of this research is also needed by other researcher to develop a better result of the research. This research is not perfect. Other researchers might find a weakness or mistakes in this research. From that weakness and mistakes, other researchers can develop a better result by eliminating the weakness and mistakes.

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The objective of the research is to find whether the formula of *O-Score* that developed by Ohlson (1980) is usable to predict the possibility of financial distress in go-public firms in Indonesia in the period of 2004 and 2005. From the explanation and research of the previous chapter, the writer can conclude that the formula of *O-Score* developed by Ohlson (1980) is usable in predicting financial distress in go-public firms in Indonesia in the period of 2004 and 2005.

The research result shown that all variables that construct the formula of Ohlson's (1908) *O-Score* have significant difference between the distressed firms and solvent firms. Although that the Huber/White standard error and covariance method is used in the research, but the result of the research shown a same result between using Huber/White standard error and covariance and using asymptotic standard error – all shown the accuracy of 100% correct for overall variable predictability.

There are two firms that its *O-Score* can't be calculated. Those firms are PT Rig Tenders Tbk in 2004 and PT Merck Tbk in 2005. The reason why the *O-Score* of these firms can't be calculated is because the firms have the amount of Yjt of less than -750. If calculated, the EXP of a number that is very small, for example less than -750, the result will turn out to be zero or error. Despite of this fact, there is no other problem in calculating the *O-Score* of the firms.

5.2 Recommendation

Although the result of the research shows a 100% correct for overall predictability, but there are still some weaknesses in the research. Hopefully the future research can eliminate or minimize the weaknesses of this research. The weaknesses of the research are:

- The data used in the research are taken from financial statement that is published by the company. The financial statement of the company are often inaccurate because the company often wants to show that they are generating profit while in reality there are generating loss. This often happen because the company wants to show a good performance to the shareholders. Or maybe they try to manipulate the financial statement to reduce the loss they generate while in reality they lost more than they reported.

- The criteria that used in the research may be insufficient or it may be too obvious in categorizing the distressed and solvent firms. This may be the cause of the 100% correct in the overall predictability. Future research may use other criteria to differentiate the distressed and solvent firms.

- The use of Huber/White standard error and covariance is also questionable. Even though there are journals to support the use of the method, it still may be doubted the accuracy. Huber/White standard error and covariance is only usable when there is no heteroskedacity problem in the research. In this research, heteroskedacity test is not conducted. Future research must conduct

the heteroskedacity test to find out the accuracy of the use of Huber/White standard error and covariance. However, the writer already test using the asymptotic standard error and the result also show the accuracy of 100% correct for overall predictability which is the same between using Huber/White standard error and covariance and using asymptotic standard error.

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APPENDICE 1

DELISTING CRITERIAS

No.	Criteria	Delisting Criteria
1	Application to Bapepam	Frozed or cancelled
2	Audit opinion	Adverse at the last year
3	Operating Profit	Loss for 4 consecutive years
4	Profit After Tax	Loss for 4 consecutive years
5	Minority shareholder's amount of stock	< 10 million shares and less than 5% of paid in capital in the last 6 months
6	Shareholders	< 100 shareholders in 6 consecutive months
7	Transaction frequency	No transactions for 9 consecutive months
8	Average transaction volume	< 10.000 share each month for the last 12 consecutive months
9	Closing price average	< Rp50 for 3 consecutive months
10	Theoretical price based on corporate action	< 20 x fraction
11	Equity	Negative for the last three consecutive years
12	Transaction status	Suspended for 12 consecutive months
13	Company status	• Merged with or acquired by other company • Liquidated • Declared bankrupt by the authority • Operating license withdrew
14	Corporate Plan	No information about corporate plan for a certain amount of time
15	Operation field	Prohibited by the law
16	Subsidiary contribution	< 50%
17	Mining Company	• No consession • No mining license • Deposit reserve insufficient • No technical-skilled manager for 6 months

Source: Tjiptono Darmaji. Hendy M Fakhruddin. *Pasar Modal di Indonesia: Pendekatan Tanya Jawab*. Salemba Empat. Jakarta 2001 page 71

APPENDICE 2

VARIABLES VALUE TABLE

2004

FIRM	Y	SIZE	TLTA	WCTA	CLCA	OENEG	NITA	FUTL	INTWO	CHIN
BUKK	1	5.590478	3.443028	-6.68277	7.682769	1	-0.12985	0.016029	0	-1
CPIN	1	6.419605	0.773963	0.090089	0.836731	0	-0.07548	-0.04297	1	-0.80184
CTTH	1	5.409208	0.824279	0.291027	0.447273	0	-0.12107	-0.08578	1	-0.64224
ADES	1	5.02757	0.705727	-0.32909	2.36891	0	-1.26182	-0.92133	0	-1
SKLT	1	5.050519	4.010308	-1.4393	4.008485	1	-0.37928	-0.01673	0	-1
SIPD	1	6.098301	0.958348	0.221317	0.384154	0	-0.12308	-0.05746	1	-0.18698
SUBA	1	6.003586	0.76476	-0.50317	5.608309	0	-0.13003	0.12623	1	0.022454
ARGO	1	6.245303	1.127282	-0.53907	3.118326	1	-0.13263	-0.04739	0	-1
ERTX	1	5.473031	0.986157	0.069249	0.889273	0	-0.07824	0.042573	1	0.338548
PAFI	1	5.851123	0.854681	0.105068	0.732343	0	-0.08368	-0.09412	1	-0.16594
TEJA	1	5.77715	3.365296	-1.70353	9.557889	1	-0.57696	-0.1405	1	-0.3206
TFCO	1	6.406106	0.736058	-0.08598	1.201424	0	-0.06286	-0.01703	1	-0.37576
MYTX	1	6.411898	0.800578	-0.09723	1.384075	0	-0.03628	-0.00883	1	0.08365
ESTI	1	5.735252	0.361288	0.318784	0.367346	0	-0.0268	-0.03439	1	0.341589
FMII	1	4.9956	0.000434	0.175499	0.002508	0	-0.58817	-412.721	1	-0.22359
BIMA	1	4.907632	3.415717	-0.46026	2.616797	1	-0.37094	-0.07377	1	0.136095
SIMM	1	5.130787	0.45397	0.061255	0.879261	0	-0.07674	-0.06939	1	0.550256
DSUC	1	5.618168	0.808024	-0.17434	1.368776	0	-0.01429	0.072708	1	0.606474
SAIP	1	6.34742	1.798505	-1.7038	27.18926	1	-0.17241	-0.01743	1	-0.75319
ETWA	1	5.689657	0.276768	0.006974	0.960513	0	-0.07839	0.018694	1	-0.10477
POLY	1	6.816605	2.653845	-2.43954	18.5858	1	-0.31239	-0.04709	1	-0.61699
KKGI	1	5.351655	0.383496	0.559804	0.371086	0	-0.00199	-0.01751	1	0.466984

FPNI	1	5.563117	0.642657	-0.18725	1.842763	0	-0.07968	-0.13783	1	-0.78568
KICI	1	5.230239	0.45815	0.154663	0.631721	0	-0.10687	-0.14864	1	-0.16311
MLIA	1	6.644623	1.427675	-0.64307	2.863505	1	-0.14623	0.012166	1	-0.58127
LPIN	1	5.112538	0.431309	-0.03819	1.09997	0	-0.02627	-0.03788	1	-0.70243
KONI	1	4.825101	0.664607	-0.05529	1.094023	0	-0.04193	0.014968	1	-0.48937
RIMO	1	5.13594	0.433698	0.144149	0.749908	0	-0.14696	-0.29049	1	-0.11479
WICO	1	5.70423	1.675127	-1.28483	4.716126	1	-0.12793	-0.05987	1	-0.35112
BMSR	1	5.325267	0.099807	0.014422	0.337101	0	-0.00582	-0.05084	1	-0.58328
MLND	1	6.123889	1.254761	-0.99131	6.57057	1	-0.12529	0.007506	1	0.378949
PWSI	1	5.531269	1.524812	-1.17527	4.973079	1	-0.05594	-0.0018	1	0.042028
RBMS	1	5.327896	0.086021	0.57283	0.1195	0	-0.00692	-0.19162	1	0.112651
RODA	1	4.888314	0.070547	0.72191	0.055866	0	-0.01288	-0.30431	1	0.139153
ABBA	1	5.105541	0.290772	0.219545	0.532405	0	-0.12924	-0.03992	1	-0.39303
DNET	1	4.349414	0.328935	0.216263	0.582434	0	-0.07389	-0.12456	1	0.095785
INDX	1	4.109882	0.030592	0.273546	0.137154	0	-0.91009	-13.5127	1	-0.40452
ITTG	1	4.237795	0.503412	0.166686	0.720845	0	-0.05899	-0.01528	1	0.471229
TMPO	1	5.065972	0.352922	0.05751	0.834004	0	-0.03717	0.009159	1	0.383663
ASIA	1	4.974843	1.057019	-0.52117	1.979898	1	-0.19266	0.037613	1	0.151722
ATPK	1	4.937362	0.01601	0.080144	0.138351	0	-0.05169	-1.91414	1	0.029915
PWON	0	6.228923	1.331895	-0.99932	9.859377	1	0.02671	0.055776	0	-0.66841
TSPC	0	6.330702	0.177374	0.543959	0.215595	0	0.150878	1.007087	0	0.000612
TCID	0	5.674277	0.158003	0.402181	0.232916	0	0.174637	1.680391	0	0.142984
MRAT	0	5.46896	0.158969	0.585877	0.19367	0	0.044668	0.451851	0	0.094548
UNVR	0	6.561947	0.375742	0.205945	0.621186	0	0.401465	1.48555	0	0.0708
APOL	0	6.178309	0.580381	0.10148	0.641793	0	0.051218	0.20682	0	0.556008
BLTA	0	6.642852	0.620962	0.059377	0.770125	0	0.05535	0.14155	0	0.239717
HITS	0	6.376629	0.622449	0.038047	0.803327	0	0.063319	0.17554	0	0.010449
TMAS	0	5.619005	0.463946	0.014979	0.93075	0	0.129724	0.381759	0	0.241463
RIGS	0	5.788199	0.075019	0.175051	0.067128	0	0.093839	2.3901	0	0.35913

SMDR	0	6.415384	0.358635	0.341337	0.404496	0	0.0767	0.379177	0	0.644097
TIRA	0	5.256723	0.58341	0.202141	0.680226	0	0.062735	0.016647	0	0.615686
ARNA	0	5.471249	0.498383	-0.02479	1.107557	0	0.084917	0.352404	0	0.098999
TOTO	0	5.850377	0.795055	0.114058	0.766939	0	0.036523	0.154097	0	-0.10085
ASGR	0	5.756648	0.420161	0.513162	0.210217	0	0.065382	0.23741	0	0.270988
MLPL	0	6.687786	0.597152	0.114488	0.738862	0	0.004746	0.050989	0	0.34307
ACAP	0	5.161167	0.202977	0.499631	0.214976	0	0.141038	0.778843	0	0.18674
ASII	0	7.592677	0.496243	0.020009	0.943084	0	0.138089	0.25613	0	0.100124
AUTO	0	6.386763	0.356298	0.134088	0.701047	0	0.09159	0.274891	0	0.06088
BRAM	0	6.233085	0.490635	0.326126	0.370297	0	0.024802	0.175495	0	-0.2711
GJTL	0	6.802166	0.734353	0.086975	0.701774	0	0.075405	0.146839	0	-0.29125
GDYR	0	5.644282	0.350934	0.325594	0.433606	0	0.056689	0.230107	0	0.206508
HEXA	0	5.803532	0.554935	0.355521	0.562373	0	0.143714	0.372585	0	0.365141
INTA	0	5.802117	0.825358	0.484123	0.452761	0	0.006974	0.069702	0	0.112247
ADMG	0	6.657943	0.676999	0.131983	0.637051	0	0.100696	0.15022	0	-0.27817
PRAS	0	5.641673	0.714845	0.220944	0.69531	0	0.027353	0.088135	0	0.00209
SMSM	0	5.813534	0.37632	0.276378	0.545745	0	0.088137	0.427939	0	0.089989
TURI	0	6.301635	0.70376	0.088912	0.829262	0	0.076259	0.12089	0	0.30627
UNTR	0	6.830548	0.536133	0.254171	0.543246	0	0.162443	0.328527	0	0.524893
FASW	0	6.419694	0.59422	0.05796	0.639604	0	0.001783	0.037917	0	-0.84172
AKRA	0	6.228633	0.403181	0.099376	0.790602	0	0.045618	0.260591	0	0.178319
BUDI	0	5.973429	0.7523	0.045156	0.877164	0	0.001582	0.124044	0	-0.46417
CLPI	0	4.916296	0.362932	0.487826	0.426598	0	0.078647	0.199392	0	0.176172
LTLS	0	6.154362	0.633701	0.159062	0.726361	0	0.036387	0.145559	0	0.743234
SOBI	0	5.72744	0.357205	0.157764	0.674154	0	0.066268	0.379533	0	0.033824
UNIC	0	6.46103	0.606799	0.269574	0.511555	0	0.056648	0.129337	0	0.446171
EKAD	0	4.802678	0.180355	0.60626	0.184382	0	0.065227	0.473974	0	-0.02369
INCI	0	5.255055	0.147251	0.594136	0.191212	0	0.065744	0.455345	0	0.192639
AKKU	0	4.575511	0.097826	0.466514	0.132622	0	0.067822	0.789459	0	0.500735

AKPI	0	6.154046	0.573568	0.152882	0.590511	0	0.004658	0.106635	0	-1.01124
AMGF	0	6.194245	0.340673	1.21E-06	0.528561	0	0.132217	0.566423	0	0.117517
BRNA	0	5.609577	0.603697	0.367543	0.294368	0	0.039404	0.165608	0	0.317367
DYNA	0	5.999182	0.531945	-0.03247	1.118174	0	0.047725	0.186551	0	-0.0697
IGAR	0	5.452878	0.322901	0.378408	0.425184	0	0.092693	0.397332	0	0.240325
TRST	0	6.281433	0.500156	0.059749	0.737949	0	0.015152	0.076582	0	-0.70883
INTP	0	6.98994	0.52351	0.048845	0.70072	0	0.011874	0.16348	0	-0.70489
SMGR	0	6.823854	0.444167	0.158862	0.626649	0	0.076347	0.325986	0	0.154757
BTON	0	4.459091	0.19861	0.244719	0.384009	0	0.081167	0.51697	0	0.956449
CTBN	0	5.813289	0.15925	0.376917	0.264344	0	0.021196	0.012867	0	-0.02098
JPRS	0	5.38994	0.469652	0.450173	0.49591	0	0.254587	0.589295	0	0.677225
LMSH	0	4.630916	0.591092	0.276878	0.609283	0	0.128778	0.363107	0	0.547218
LION	0	5.166439	0.178544	0.6615	0.162215	0	0.130549	1.115642	0	0.315222
RDTX	0	5.507544	0.148753	0.123067	0.447589	0	0.037887	0.281025	0	0.292104
DOID	0	5.919317	0.650974	0.20635	0.434127	0	0.00108	0.017094	0	0.642857
GRIV	0	6.037133	0.590154	-0.05198	1.116635	0	0.013211	0.087965	0	-0.96937
INDR	0	6.6935	0.555739	0.09568	0.763724	0	0.009319	0.040552	0	0.059123
PBRX	0	5.105425	0.379361	0.48069	0.41239	0	0.060671	0.153601	0	0.141045
RICY	0	5.473307	0.262697	0.512999	0.325021	0	0.091836	0.335087	0	0.76638
BATA	0	5.416199	0.345274	0.405623	0.411539	0	0.135421	0.672591	0	-0.00873
TIRT	0	5.907716	0.719397	-0.03656	1.076635	0	0.01245	0.097528	0	0.230534
GGRM	0	7.313686	0.407649	0.26631	0.593514	0	0.08694	0.347658	0	-0.01336
HMSP	0	7.068159	0.557506	0.424285	0.438192	0	0.170254	0.488053	0	0.172127
ADHI	0	6.261092	0.81663	0.336074	0.61186	0	0.038637	0.096978	0	0.30552
PTRO	0	5.910069	0.262319	0.541125	3.126801	0	0.070979	0.103144	0	0.403437
AQUA	0	5.826793	0.459866	0.435765	0.227084	0	0.136464	0.378051	0	0.183016
DAVO	0	6.192554	0.562974	0.242689	0.001793	0	0.062713	0.194156	0	0.03635
DLTA	0	5.658244	0.21825	0.498513	0.241834	0	0.085027	0.585807	0	0.013683
FAST	0	5.507834	0.394548	0.082305	0.781579	0	0.115894	0.377501	0	0.015326

INDF	0	7.195162	0.684447	0.132553	0.676145	0	0.024686	0.195601	0	-0.21866
MYOR	0	6.107429	0.310915	0.400416	0.1958	0	0.066456	0.328079	0	0.002887
MLBI	0	5.742789	0.548802	-0.00854	1.017606	0	0.157867	0.345842	0	-0.01639
PSDN	0	5.254314	1.469575	-0.0466	1.098343	1	0.00436	0.082257	0	-0.99809
SHDA	0	6.086369	0.16078	0.634903	0.17843	0	0.149077	1.273955	0	-0.09625
STTP	0	5.672261	0.323738	0.230845	0.504017	0	0.060826	0.314505	0	-0.04322
TBLA	0	6.131006	0.62147	0.087708	0.701954	0	0.01217	0.15963	0	-0.23265
ULTJ	0	6.114024	0.377086	0.263156	0.207562	0	0.003393	0.176326	0	-0.2583
ANTM	0	6.781227	0.595795	0.341727	0.306433	0	0.134088	0.304588	0	0.56298
BUMI	0	7.143118	0.932802	-0.09857	1.33766	0	0.077645	0.188897	0	0.818775
ENRG	0	6.427003	0.839125	-0.10978	1.977361	0	0.027746	0.026329	0	0.656863
INCO	0	7.180536	0.293737	0.159812	0.439526	0	0.175584	0.877208	0	0.220509
MEDC	0	7.139024	0.000636	0.227558	0.470008	0	0.050162	0.191471	0	0.203808
PGAS	0	7.042957	0.66124	0.319505	0.26587	0	0.042967	0.136692	0	-0.03572
PTBA	0	6.37257	0.2879	0.505417	0.264342	0	0.017601	0.733014	0	0.332299
TINS	0	6.383089	0.375275	0.351389	0.389569	0	0.073638	0.314356	0	0.659549
AALI	0	6.529279	0.384292	0.063566	0.327049	0	0.236715	0.104456	0	0.480944
UNSP	0	6.051054	0.654147	0.006564	0.959613	0	0.085278	0.273033	0	0.087841
CPDW	0	4.489072	0.597302	0.119629	0.82631	0	1.139443	-0.0734	0	0.782925
MAIN	0	5.379019	0.814558	-0.21392	1.478496	0	0.020306	0.115174	0	-0.12266
WAPO	0	5.201545	0.503326	0.193846	0.710095	0	0.012882	0.16732	0	0.007375
PJAA	0	5.887735	0.272201	0.173203	0.518268	0	0.143237	0.795477	0	0.025078
PNSE	0	5.269415	0.61615	0.11323	0.619302	0	0.019139	0.311988	0	-0.26822
PUDP	0	5.524035	0.423781	-0.06404	1.186999	0	0.010122	0.094947	0	-0.49124
SMRA	0	6.169951	0.561517	-0.14163	1.492886	0	0.099406	0.281172	0	0.085707
SIIP	0	5.711979	0.224315	-0.05186	1.300825	0	0.107146	0.757597	0	0.701665
ZBRA	0	5.131384	0.491226	-0.0306	1.22584	0	0.010331	0.115013	0	0.057489
ISAT	0	7.445175	0.521067	0.074635	0.683517	0	0.058596	0.220201	0	-0.57662
IATG	0	5.522625	0.448684	0.440429	0.157707	0	0.120094	0.252398	0	0.428271

TLKM	0	7.749575	0.589413	-0.04402	1.268701	0	0.117741	0.440552	0	0.041517
AIMS	0	4.551243	0.507939	0.329483	0.589007	0	0.017789	0.121224	0	0.168975
ALFA	0	5.870689	0.568693	0.116818	0.749568	0	0.006826	0.004007	0	-0.24538
EPMT	0	6.218007	0.649623	0.372632	0.583467	0	0.107763	0.226917	0	0.074172
FISH	0	5.07776	0.486723	0.226306	0.678313	0	0.007332	0.019874	0	-0.78452
MPPA	0	6.6113	0.523597	0.149463	0.666928	0	0.031177	0.109022	0	0.049091
SDPC	0	5.136054	0.669727	0.225711	0.747444	0	0.028299	0.12196	0	-0.09227
MAPI	0	6.246984	0.427567	0.176702	0.672946	0	0.064498	0.268368	0	0.197792
MICE	0	5.11223	0.528597	0.185469	0.707927	0	0.135194	0.527138	0	0.249714
RALS	0	6.408014	0.352565	0.33396	0.457288	0	0.121842	0.358998	0	0.01406
TGKA	0	5.836222	0.634296	0.282438	0.635292	0	0.00571	0.018925	0	-0.87256
SQBI	0	5.287172	0.345397	0.483721	0.323193	0	0.208302	0.997549	0	0.176392
DVLA	0	5.634653	0.260097	0.469989	0.258987	0	0.115524	0.713902	0	0.01175
KLBF	0	6.626449	0.539849	0.511834	0.345719	0	0.106521	0.404387	0	0.165222
KAEF	0	6.06946	0.305815	0.28635	0.492156	0	0.066263	0.347519	0	0.261755
MERK	0	5.302041	0.231605	0.45476	0.323277	0	0.28553	1.78591	0	0.061761
PYFA	0	4.847758	0.117663	0.069005	0.620787	0	0.020332	0.292506	0	0.396392
CENT	0	4.918502	0.088997	0.504596	0.09338	0	0.04991	0.322489	0	-0.11536
CMNP	0	6.209168	0.295845	-0.14879	4.59289	0	0.053445	0.388935	0	-0.16826
FORU	0	4.995359	0.301869	0.547712	0.341535	0	0.049112	0.218476	0	0.143025
LMAS	0	5.219223	0.291775	0.517825	0.318033	0	0.2538	1.213836	0	0.493712
RUIS	0	5.255193	0.576611	0.258075	0.628891	0	0.065384	0.209509	0	-0.22376
SCMA	0	6.285627	0.370267	0.3213	0.270293	0	0.026982	0.296476	0	-0.13996
ANTA	0	5.338492	0.67383	0.200006	0.745738	0	0.029282	0.019257	0	0.930451
PANR	0	5.355522	0.436294	0.099648	0.768653	0	0.001883	0.011797	0	-0.66719
PLIN	0	6.308235	0.341553	0.141412	0.494523	0	0.05163	0.359142	0	-0.09325
ARTI	0	5.541724	0.63486	0.143872	0.814616	0	0.007469	0.081356	0	0.653418
ELTY	0	6.086713	0.530946	0.057828	0.831787	0	0.029992	0.035073	0	-0.69259
CTRS	0	6.190641	0.449409	0.016163	0.965109	0	0.03958	0.090875	0	0.131108

DUTI	0	6.672584	0.563964	-0.20885	0.533985	0	0.012676	0.04228	0	-0.23813
GMTD	0	5.418783	0.732008	-0.60816	5.910571	0	0.024389	0.029792	0	0.043982
JAKA	0	5.19585	0.08801	0.463811	0.143351	0	0.004873	-0.01426	0	-0.1292
JRPT	0	6.142344	0.401267	0.121077	0.654065	0	0.02999	0.113787	0	0.099323
KARK	0	4.884767	0.338614	0.221423	0.596435	0	0.009857	0.07705	0	0.035616
KIJA	0	6.902047	0.26069	0.220165	0.502941	0	0.004732	0.00043	0	-0.92302
KPIG	0	4.989508	0.041224	0.553092	0.06365	0	0.025324	0.409543	0	0.518894
LAMI	0	5.506853	0.497499	0.391384	0.412346	0	0.004523	0.045875	0	0.040831
LPCK	0	6.053022	0.610051	-0.02666	1.046258	0	0.02561	0.081527	0	0.437349
LPKR	0	6.744776	0.693872	-0.26163	1.658972	0	0.052719	0.095334	0	0.021476
MAMI	0	5.667863	0.059552	0.018694	0.366417	0	0.27974	0.03431	0	0.155538
MTSM	0	5.048251	0.425589	-0.20251	3.783641	0	0.051185	0.013898	0	0.177318

2005

FIRM	Y	SIZE	TLTA	WCTA	CLCA	OENEG	NITA	FUTL	INTWO	CHIN
PWON	0	6.228939	0.952383	0.005917	0.961239	0	0.3795	0.098411	0	0.868498
TSPC	0	6.370284	0.201416	0.483144	0.262972	0	0.126537	0.748155	0	-0.04237
TCID	0	5.73695	0.158149	0.41306	0.226085	0	0.170177	1.49376	0	0.059154
MRAT	0	5.463364	0.120456	0.619706	0.142354	0	0.02928	0.372722	0	-0.21426
UNVR	0	6.584597	0.431608	0.137644	0.739516	0	0.374897	1.22432	0	-0.00816
APOL	0	6.426394	0.578091	0.043149	0.822392	0	0.063208	0.190707	0	0.372042
BLTA	0	6.898099	0.74605	0.080089	0.6847	0	0.08158	0.177718	0	0.452484
HITS	0	6.363225	0.533397	0.02787	0.836029	0	0.061967	0.217606	0	-0.02622
TMAS	0	5.826053	0.502493	-0.07305	1.535376	0	0.188756	0.487071	0	0.401887
RIGS	0	5.826326	0.040958	0.565994	0.054542	0	0.080703	1.916926	0	-0.0315
SMDR	0	6.509826	0.334708	0.383371	0.374423	0	0.105956	0.500255	0	0.263897
TIRA	0	5.25594	0.560909	0.295728	0.54558	0	0.016436	0.147163	0	-0.58539
ARNA	0	5.562048	0.519655	-0.07174	1.296922	0	0.097093	0.36452	0	0.169871
TOTO	0	5.928466	0.74552	0.078592	0.823798	0	0.074144	0.138271	0	0.416897
ASGR	0	5.715003	0.450899	0.417877	0.300272	0	0.06952	0.240758	0	-0.01726
MLPL	0	6.73893	0.562154	0.068872	0.803346	0	0.011076	0.104324	0	0.448339
ACAP	0	5.159612	0.204127	0.501499	0.219266	0	0.110591	0.783575	0	-0.12276
ASII	0	7.671967	0.484288	0.033372	0.903037	0	0.116147	0.281875	0	0.004767
AUTO	0	6.481223	0.383091	0.187723	0.58506	0	0.092135	0.254407	0	0.111252
BRAM	0	6.232832	0.416636	0.36638	0.349797	0	0.069907	0.326685	0	0.476015
GJTL	0	6.873865	0.728597	0.191152	0.43276	0	0.054456	0.063646	0	-0.08002
GDYR	0	5.655237	0.404357	0.373289	0.452339	0	-0.01603	-0.06094	0	-1.81716
HEXA	0	6.029186	0.677647	0.190492	0.75712	0	0.091416	0.197336	0	0.03358
INTA	0	5.948239	0.644621	0.450789	0.501499	0	0.020276	0.119463	0	0.535797
ADMG	0	6.646591	0.659792	0.293505	0.235463	0	0.009462	0.032958	0	-0.83227
PRAS	0	5.749052	0.769113	0.136642	0.81238	0	0.008198	0.04338	0	-0.44532

SMSM	0	5.821604	0.342716	0.285505	0.509877	0	0.090682	0.529806	0	0.023522
TURI	0	6.435094	0.750982	0.101461	0.825456	0	0.052412	0.082305	0	-0.03384
UNTR	0	7.02669	0.609932	0.191432	0.639171	0	0.09881	0.263709	0	-0.02274
FASW	0	6.459665	0.627877	0.079641	0.547085	0	0.002022	0.075532	0	0.108617
AKRA	0	6.296613	0.423348	0.113291	0.777243	0	0.060254	0.229216	0	0.214039
BUDI	0	5.990604	0.761664	0.038318	0.899506	0	0.002331	0.107509	0	0.210401
CLPI	0	5.032087	0.456914	0.423041	0.519247	0	0.073049	0.225816	0	0.096091
LTLS	0	6.20652	0.647894	0.10779	0.816401	0	0.032585	0.145048	0	0.004369
SOBI	0	5.775714	0.380488	0.233093	0.604336	0	0.059637	0.286144	0	0.002861
UNIC	0	6.431108	0.538071	0.21232	0.527586	0	0.018104	0.119137	0	-0.54047
EKAD	0	4.87601	0.270848	0.502701	0.312049	0	0.068982	0.165291	0	0.111945
INCI	0	5.253365	0.104508	0.658944	0.129605	0	0.064672	0.516045	0	-0.01143
AKKU	0	4.616769	0.155977	0.230171	0.355267	0	0.035889	0.162845	0	-0.26431
AKPI	0	6.165247	0.564686	0.15142	0.60256	0	0.007707	0.085256	0	0.258693
AMGF	0	6.194703	0.233016	0.311472	0.30988	0	0.135758	0.71394	0	0.013741
BRNA	0	5.600311	0.598544	0.327557	0.316353	0	0.008339	0.102321	0	-0.6568
DYNA	0	6.030886	0.567195	-0.05495	1.191891	0	0.019195	0.089328	0	-0.396
IGAR	0	5.438903	0.260949	0.473337	0.298575	0	0.050151	0.363496	0	-0.31241
TRST	0	6.323142	0.544791	0.054268	0.832928	0	0.007807	0.069399	0	-0.27618
INTP	0	7.022691	0.46572	0.123375	0.397002	0	0.070203	0.164244	0	0.728826
SMGR	0	6.863142	0.375582	0.21924	0.57232	0	0.140136	0.48457	0	0.335395
BTON	0	4.442809	0.104866	0.383608	0.160363	0	0.063129	0.712418	0	-0.14342
CTBN	0	6.026896	0.409989	0.309422	0.554242	0	0.069114	0.180782	0	0.68417
JPRS	0	5.311733	0.198732	0.712825	0.190007	0	0.166272	1.182532	0	-0.2941
LMSH	0	4.624746	0.496904	0.314035	0.56713	0	0.097449	0.349919	0	-0.14544
LION	0	5.217563	0.186015	0.678695	0.160162	0	0.11527	0.815232	0	-0.1064
RDTX	0	5.562088	0.191339	0.028731	0.834489	0	0.057929	0.268129	0	0.268357
DOID	0	5.965885	0.615977	0.372569	0.096555	0	0.003709	0.041319	0	0.585298
GRIV	0	6.079415	0.623628	0.156335	0.651163	0	0.005999	0.09961	0	-0.33284

INDR	0	6.740638	0.579087	0.114857	0.700496	0	0.003707	0.032278	0	-0.38557
PBRX	0	5.591305	0.7223	0.15319	0.81659	0	0.026398	0.071718	0	0.142334
RICY	0	5.620483	0.388865	0.399817	0.363571	0	0.089763	0.344879	0	0.156721
BATA	0	5.485408	0.423453	0.337538	0.516893	0	0.08204	0.334592	0	-0.16927
TIRT	0	5.932942	0.721866	-0.00871	1.014914	0	0.011798	0.090381	0	0.002131
GGRM	0	7.344959	0.406786	0.281122	0.577081	0	0.085393	0.349789	0	0.027022
HMSP	0	7.076808	0.595985	0.302686	0.586165	0	0.199677	0.553858	0	0.089422
ADHI	0	6.382728	0.844687	0.222831	0.745591	0	0.032279	0.085248	0	0.050093
PTRO	0	6.018459	0.372713	0.409871	0.388402	0	0.080137	0.203435	0	0.183371
AQUA	0	5.863671	0.433021	0.525715	0.131991	0	0.08808	0.22918	0	-0.17464
DAVO	0	6.242266	0.553681	0.040432	0.88919	0	0.05156	0.167606	0	-0.04703
DLTA	0	5.730609	0.243575	0.519133	0.270694	0	0.104884	0.560611	0	0.186063
FAST	0	5.577033	0.396134	0.039933	0.880071	0	0.109263	0.351895	0	0.050568
INDF	0	7.169853	0.679192	0.139255	0.681834	0	0.008387	0.165545	0	-0.51455
MYOR	0	6.164344	0.375839	0.33193	0.282739	0	0.031323	0.170464	0	-0.30096
MLBI	0	5.759959	0.603829	-0.1746	1.469572	0	0.151227	0.363476	0	-0.00172
PSDN	0	5.453832	0.652105	0.386321	0.160739	0	0.416525	0.158249	0	0.986864
SHDA	0	6.036335	0.131032	0.650005	0.142846	0	0.365201	2.033945	0	0.371694
STTP	0	5.678922	0.311752	0.258883	0.464688	0	0.022279	0.139925	0	-0.45779
TBLA	0	6.161799	0.646432	0.011808	0.951403	0	0.004285	0.12729	0	-0.45144
ULTJ	0	6.098451	0.350053	0.122465	0.631086	0	0.00361	0.139214	0	0.012975
ANTM	0	6.806364	0.526819	0.204305	0.373366	0	0.131497	0.336727	0	0.019179
BUMI	0	7.21607	0.881535	-0.06043	1.181343	0	0.074308	0.182775	0	0.061947
ENRG	0	6.704082	0.873159	0.104886	0.523427	0	0.038705	0.075933	0	0.450584
INCO	0	7.208441	0.215012	0.202662	0.274329	0	0.163749	1.194427	0	-0.00277
MEDC	0	7.181342	0.59277	0.15006	0.506603	0	0.048413	0.261686	0	0.030965
PGAS	0	7.098566	0.612245	0.291511	0.278709	0	0.068699	0.202059	0	0.2901
PTBA	0	6.453271	0.27352	0.57257	0.221658	0	0.164476	0.722272	0	0.053287
TINS	0	6.439042	0.441702	0.270192	0.546874	0	0.039117	0.174419	0	-0.24669

AALI	0	6.504024	0.153014	0.063592	0.706416	0	0.247644	0.834501	0	-0.00651
UNSP	0	6.095138	0.605813	0.117286	0.478815	0	0.092951	0.302149	0	0.093559
CPDW	0	4.541879	0.617764	0.13261	0.810745	0	0.025615	0.072933	0	-0.95048
MAIN	0	5.496968	0.663333	-0.07651	1.150371	0	0.149853	0.409428	0	0.812782
WAPO	0	5.256246	0.550215	0.177025	0.74983	0	0.012988	0.145022	0	0.06694
PJAA	0	5.957126	0.286155	-0.1386	1.628064	0	0.13742	0.659509	0	0.059091
PNSE	0	5.255643	0.607198	0.06473	0.73645	0	0.013219	0.346498	0	-0.18712
PUDP	0	5.510872	0.400075	-0.03166	1.091805	0	0.010258	0.085637	0	-0.0085
SMRA	0	6.270623	0.550281	-0.02724	1.062986	0	0.081088	0.227138	0	0.014067
SIIP	0	5.793257	0.130393	0.000541	0.995868	0	0.124975	1.365113	0	0.168901
ZBRA	0	5.132381	0.485874	-0.12299	2.843519	0	0.006215	0.168687	0	-0.24766
ISAT	0	7.515703	0.558027	0.063916	0.721587	0	0.049516	0.199601	0	-0.00299
IATG	0	5.578553	0.417412	0.325048	0.221317	0	0.092013	0.266095	0	-0.06868
TLKM	0	7.793588	0.523933	-0.05161	1.311379	0	0.128574	0.527139	0	0.094398
AIMS	0	4.7878	0.702289	0.201848	0.770562	0	0.012291	0.06731	0	0.087239
ALFA	0	5.85723	0.541244	0.122564	0.722183	0	0.013813	0.004312	0	0.324762
EPMT	0	6.269217	0.58738	0.444157	0.499154	0	0.109378	0.260112	0	0.066297
FISH	0	5.156646	0.542278	0.218487	0.707447	0	0.03304	0.072538	0	0.687678
MPPA	0	6.660711	0.53429	0.074436	0.776493	0	0.048634	0.126216	0	0.272175
SDPC	0	5.207971	0.676593	0.254998	0.725311	0	0.043537	0.125839	0	0.28966
MAPI	0	6.283895	0.417448	0.126123	0.742778	0	0.068627	0.241352	0	0.073392
MICE	0	5.322556	0.243083	0.532591	0.287141	0	0.131431	0.945935	0	0.224162
RALS	0	6.368872	0.246066	0.36436	0.34807	0	0.129313	0.556097	0	-0.01531
TGKA	0	5.907578	0.681713	0.252922	0.686296	0	0.024183	0.045705	0	0.666198
SQBI	0	5.217542	0.386476	0.374883	0.415219	0	0.054829	0.228154	0	-0.63368
DVLA	0	5.740859	0.290622	0.509314	0.28553	0	0.12999	0.476519	0	0.179303
KLBF	0	6.674711	0.385246	0.581869	0.247213	0	0.138172	0.607329	0	0.183538
KAEF	0	6.070999	0.283102	0.320207	0.443726	0	0.04486	0.254117	0	-0.1909
MERK	0	5.338524	0.172712	0.551414	0.211766	0	0.264638	2.177497	0	0.004011

PYFA	0	4.883951	0.170866	0.067876	0.708221	0	0.017348	0.213532	0	-0.03768
CENT	0	4.928232	0.076491	0.558961	0.074643	0	0.042044	0.733189	0	-0.07441
CMNP	0	6.225922	0.283465	0.013025	0.823171	0	0.048161	0.37154	0	-0.03276
FORU	0	5.118344	0.422824	0.464622	0.464589	0	0.049473	0.138185	0	0.144241
LMAS	0	5.196314	0.28971	0.440528	0.360908	0	0.003595	-0.0244	0	-0.97348
RUIS	0	5.287479	0.567076	0.271552	0.625548	0	0.073255	0.254123	0	0.093731
SCMA	0	6.280965	0.386038	0.32873	0.304313	0	0.034249	0.281856	0	0.113388
ANTA	0	5.370709	0.665873	0.217827	0.724858	0	0.030881	0.029395	0	0.070404
PANR	0	5.446852	0.547532	0.042869	0.901562	0	0.000811	0.031331	0	-0.30581
PLIN	0	6.298858	0.264223	0.080729	0.655025	0	0.056372	0.55768	0	0.033126
ARTI	0	5.563051	0.642452	0.149303	0.810822	0	0.008856	0.073562	0	0.109284
ELTY	0	6.407727	0.491245	0.339792	0.475778	0	0.036197	0.037126	0	0.433017
CTRS	0	6.273324	0.486569	0.341915	0.585657	0	0.063834	0.168552	0	0.322272
DUTI	0	6.663902	0.563983	-0.17719	1.506663	0	0.013195	0.042304	0	0.010075
GMTD	0	5.425042	0.71789	-0.2145	1.4261	0	0.024822	0.029451	0	0.015998
JAKA	0	5.203696	0.099484	0.476596	0.165423	0	0.00986	0.009496	0	0.346433
JRPT	0	6.160878	0.282708	0.118259	0.681085	0	0.046415	0.248354	0	0.235227
KARK	0	4.877556	0.324836	0.230963	0.573784	0	0.002691	0.057258	0	-0.57664
KIJA	0	6.295925	0.19091	0.304063	0.350311	0	0.067788	0.378549	0	0.869229
KPIG	0	4.989752	0.042133	0.48157	0.076352	0	0.025413	0.363062	0	0.002019
LAMI	0	5.573851	0.564555	0.330044	0.535941	0	0.004509	0.050284	0	0.075406
LPCK	0	6.045552	0.599902	0.042344	0.933195	0	0.003361	0.056119	0	-0.77147
LPKR	0	5.794644	0.521251	0.122335	0.798264	0	0.057595	0.164997	0	0.101294
MAMI	0	5.793928	0.044944	0.014936	0.342554	0	0.007708	0.193535	0	-0.92895
MTSM	0	5.00768	0.321288	-0.1823	3.820337	0	0.048043	0.073298	0	-0.07823
BUKK	1	5.64256	3.296294	-2.61179	5.788998	1	-0.12936	0.007096	1	-0.05799
CPIN	1	6.418306	0.757578	0.133577	0.758662	0	0.015708	0.143448	0	1
CTTH	1	5.365668	0.927737	0.202007	0.613004	0	-0.12199	-0.06458	1	0.046315
ADES	1	5.322327	1.418473	-1.0383	4.587476	1	-0.56775	-0.3886	1	0.059891

SKLT	1	4.990405	0.785207	0.175801	0.705553	0	0.936482	-0.10247	0	1
SIPD	1	6.063623	0.184761	0.163415	0.513107	0	-0.10579	-0.39673	1	0.115112
SUBA	1	5.923307	1.107725	-0.95852	34.80266	1	-0.39251	-0.16926	1	-0.43006
ARGO	1	6.291068	1.110236	-5.69068	3.494705	1	-0.10955	-0.0402	1	0.04287
ERTX	1	5.474506	1.040014	-0.16492	1.26899	1	-0.05504	0.064479	1	0.174991
PAFI	1	5.841118	0.900572	0.006342	0.985401	0	-0.04928	-0.0921	1	0.269445
TEJA	1	5.720572	3.967808	-1.92797	13.3312	1	-0.27339	-0.05735	1	0.412457
TFCO	1	6.426355	0.849011	-0.15999	1.420131	0	-0.11017	-0.05838	1	-0.29488
MYTX	1	6.38017	0.858365	-0.11512	1.469492	0	-0.03955	0.00191	1	-0.00666
ESTI	1	5.770769	0.427173	0.330451	0.417994	0	-0.0156	0.00733	1	0.225592
FMII	1	5.1673	0.357913	-0.33208	13.85594	0	-0.03099	-0.10028	1	0.854858
BIMA	1	4.937909	3.398452	-0.48208	2.296212	1	-0.14541	-0.03198	1	0.408138
SIMM	1	5.116704	0.554151	-0.01763	1.033333	0	-0.11293	-0.13753	1	-0.17514
DSUC	1	5.597738	0.926931	-0.38054	1.601318	0	-0.12808	-0.03417	1	-0.79057
SAIP	1	6.32667	2.120944	-1.9259	26.44209	1	-0.28336	-0.01656	1	-0.22083
ETWA	1	5.672027	0.251267	2.98E-05	0.999775	0	-0.00446	0.006123	1	0.896293
POLY	1	6.784887	1.988228	-1.7189	11.6108	1	-0.13814	-0.04774	1	0.417375
KKGI	1	5.36456	0.418704	0.483035	0.415364	0	-0.01715	-0.09111	1	-0.79724
FPNI	1	5.521683	0.778766	-0.36299	2.753404	0	-0.17188	-0.14857	1	-0.32453
KICI	1	5.208049	0.520873	0.132038	0.704237	0	-0.06295	-0.11985	1	0.278737
MLIA	1	6.614474	1.651068	-0.94519	3.676182	1	-0.15179	0.011321	1	0.016061
LPIN	1	5.068405	0.467055	-0.09495	1.26596	0	-0.09658	-0.06169	1	-0.53715
KONI	1	4.821068	0.672017	-0.05875	1.113526	0	-0.01054	0.043003	1	0.601257
RIMO	1	5.097986	0.484073	0.197689	0.706153	0	-0.09444	-0.07014	1	0.266255
WICO	1	5.627374	2.075838	-1.68803	6.072602	1	-0.27001	-0.08719	1	-0.27754
BMSR	1	5.317769	0.092544	0.002261	0.769946	0	-0.00807	-0.06862	1	-0.15366
MLND	1	6.143216	1.325422	-1.05236	6.726384	1	-0.08658	0.004658	1	0.161094
PWSI	1	5.502551	1.707967	-1.33969	5.480894	1	-0.0936	0.0018	1	-0.22063
RBMS	1	5.315132	0.086273	0.534997	0.137951	0	-0.01091	-0.244	1	-0.20976

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RODA	1	4.868686	0.047506	0.710136	0.049729	0	-0.01989	-0.58189	1	-0.19458
ABBA	1	5.074681	0.304817	0.075318	0.701056	0	-0.07142	-0.10351	1	0.331197
DNET	1	4.321888	0.356128	0.232272	0.593495	0	-0.07105	-0.16941	1	0.051225
INDX	1	3.923348	0.023264	0.102839	0.295176	0	-0.51277	-25.8872	1	0.463387
ITTG	1	4.295457	0.731527	-0.0786	1.137333	0	-0.16637	-0.20673	1	-0.52613
TMPO	1	5.094373	0.429292	0.116511	0.725553	0	-0.06398	-0.08435	1	-0.29264
ASIA	1	4.959733	1.227308	-0.76771	2.703128	1	-0.13536	-0.05663	1	0.084877
ATPK	1	4.925075	0.007878	0.108373	0.050495	0	-0.02012	-2.3454	1	0.451038

APPENDICE 3
O-SCORE CALCULATION

2004

FIRM	O-SCORE
BUKK	0.999999
CPIN	1
CTTH	1
ADES	0.999965
SKLT	0.999999
SIPD	1
SUBA	1
ARGO	1
ERTX	1
PAFI	1
TEJA	1
TFCO	1
MYTX	1
ESTI	1
FMII	1
BIMA	1
SIMM	1
DSUC	1
SAIP	1
ETWA	1
POLY	1
KKGI	1
FPNI	1
KICI	1
MLIA	1
LPIN	1
KONI	1
RIMO	1
WICO	1
BMSR	1
MLND	1
PWSI	1
RBMS	1
RODA	1
ABBA	1
DNET	1
INDX	1
ITTG	1
TMPO	1
ASIA	1
ATPK	1

PWON	1.66E-33
TSPC	7.8E-165
TCID	1.9E-251
MRAT	3.8E-103
UNVR	2.4E-219
APOL	4.51E-34
BLTA	1.85E-36
HITS	8.86E-58
TMAS	2.63E-85
RIGS	#NUM!
SMDR	4.71E-48
TIRA	1.38E-22
ARNA	2.1E-92
TOTO	1.66E-68
ASGR	2.48E-60
MLPL	1.68E-18
ACAP	3.8E-144
ASII	6.77E-46
AUTO	7.73E-69
BRAM	2.79E-74
GJTL	6.19E-63
GDYR	8.74E-66
HEXA	5.07E-73
INTA	9.71E-45
ADMG	3.12E-65
PRAS	2.42E-58
SMSM	5.53E-95
TURI	6.02E-36
UNTR	6.82E-42
FASW	1.51E-91
AKRA	6.02E-63
BUDI	3.18E-83
CLPI	3.64E-76
LTLS	5.23E-17
SOBI	1.18E-93
UNIC	1.01E-25
EKAD	3.9E-123
INCI	7.3E-102
AKKU	9.9E-137
AKPI	9.4E-108
AMGF	1.2E-103
BRNA	1.14E-49
DYNA	4.85E-72

IGAR	1.31E-88
TRST	7.72E-87
INTP	2.58E-85
SMGR	5.1E-62
BTON	1.38E-79
CTBN	3.14E-48
JPRS	5.35E-91
LMSH	4.35E-80
LION	5.7E-180
RDTX	1.17E-69
DOID	8.43E-08
GRIV	7.1E-108
INDR	4.15E-33
PBRX	5.9E-69
RICY	7.62E-52
BATA	1.2E-137
TIRT	4.52E-44
GGRM	7.94E-67
HMSP	1.4E-77
ADHI	2.37E-32
PTRO	1.79E-57
AQUA	1.01E-81
DAVO	6.66E-57
DLTA	3.1E-121
FAST	1.63E-98
INDF	1.02E-58
MYOR	8.84E-81
MLBI	2.67E-93
PSDN	4.98E-07
SHDA	8.7E-208
STTP	7.1E-90
TBLA	3.64E-72
ULTJ	1.81E-74
ANTM	1.19E-35
BUMI	0.000223
ENRG	2.23E-09
INCO	5.1E-122
MEDC	4.99E-39
PGAS	7.63E-42
PTBA	5.5E-110
TINS	2.05E-39
AALI	1.08E-23
UNSP	6.06E-72
CPDW	1.02E-23
MAIN	8.86E-76
WAPO	4.37E-76
PJAA	1.1E-143
PNSE	1.6E-106

PUDP	4.84E-92
SMRA	3.74E-75
SIIP	2.7E-109
ZBRA	1.09E-70
ISAT	1.66E-78
IATG	9.53E-57
TLKM	3.63E-71
AIMS	1.31E-71
ALFA	2.54E-58
EPMT	1.36E-63
FISH	3.5E-103
MPPA	1.82E-43
SDPC	1.54E-76
MAPI	4.38E-62
MICE	5.1E-110
RALS	4.17E-81
TGKA	6.55E-95
SQBI	1.5E-170
DVLA	9.9E-138
KLBF	7.11E-74
KAEF	2.96E-71
MERK	1.6E-276
PYFA	5.95E-77
CENT	1.7E-106
CMNP	3.8E-127
FORU	6.46E-79
LMAS	4.2E-182
RUIS	5.78E-93
SCMA	2.62E-81
ANTA	0.000579
PANR	1.57E-91
PLIN	2.47E-87
ARTI	4.96E-24
ELTY	4.08E-84
CTRS	1.86E-45
DUTI	1.55E-46
GMTD	6.83E-88
JAKA	1.82E-60
JRPT	3.13E-49
KARK	1.69E-68
KIJA	3.18E-79
KPIG	1.76E-81
LAMI	6.32E-53
LPCK	6.11E-29
LPKR	1.06E-45
MAMI	5.11E-45
MTSM	2.65E-72

2005

FIRM	O-SCORE
PWON	6.78E-05
TSPC	8E-134
TCID	1.2E-231
MRAT	3.2E-110
UNVR	1.3E-190
APOL	2.05E-39
BLTA	3.92E-24
HITS	5.39E-66
TMAS	8.32E-91
RIGS	1E-287
SMDR	4.96E-83
TIRA	2.6E-104
ARNA	9.47E-90
TOTO	1.29E-37
ASGR	2.64E-77
MLPL	4.47E-19
ACAP	1.3E-161
ASII	9.19E-53
AUTO	3.07E-61
BRAM	5.85E-53
GJTL	4.22E-38
GDYR	4.5E-140
HEXA	3.65E-65
INTA	3.95E-28
ADMG	2.21E-78
PRAS	1.28E-75
SMSM	2.9E-111
TURI	2.8E-47
UNTR	3.09E-60
FASW	3.07E-36
AKRA	6.11E-56
BUDI	8.03E-44
CLPI	8.59E-82
LTLS	4.59E-57
SOBI	1.41E-82
UNIC	3.81E-79
EKAD	9.77E-76
INCI	7.4E-121
AKKU	1.6E-99
AKPI	3.9E-35
AMGF	1.5E-128
BRNA	2.97E-95
DYNA	2.51E-77
IGAR	1.4E-114
TRST	1.91E-61

INTP	7.83E-05
SMGR	3.73E-72
BTON	2.5E-164
CTBN	8.39E-28
JPRS	5.2E-220
LMSH	7.4E-117
LION	2.1E-164
RDTX	7.31E-71
DOID	8.38E-12
GRIV	6.53E-71
INDR	3.07E-55
PBRX	7.07E-50
RICY	3.38E-83
BATA	1.4E-102
TIRT	5.23E-55
GGRM	2.55E-64
HMSP	1.01E-90
ADHI	3.39E-43
PTRO	6.19E-58
AQUA	1.05E-81
DAVO	4.42E-63
DLTA	8.9E-108
FAST	1.01E-92
INDF	1.25E-71
MYOR	1.76E-76
MLBI	1.28E-96
PSDN	3.13E-16
SHDA	9.1E-280
STTP	2.46E-90
TBLA	5.75E-81
ULTJ	8.66E-58
ANTM	2.32E-69
BUMI	2.12E-43
ENRG	2.29E-12
INCO	6.2E-173
MEDC	5.38E-53
PGAS	1.19E-31
PTBA	4.8E-124
TINS	5.54E-71
AALI	6.6E-143
UNSP	8.08E-72
CPDW	2.2E-127
MAIN	1.97E-59
WAPO	4.45E-69
PJAA	2.1E-130
PNSE	4.3E-107

PUDP	4.33E-64
SMRA	5.95E-68
SIIP	4.6E-212
ZBRA	3.4E-106
ISAT	3.69E-43
IATG	7.46E-85
TLKM	3.65E-79
AIMS	4.41E-65
ALFA	3.19E-27
EPMT	1.7E-67
FISH	1.6E-27
MPPA	4.64E-33
SDPC	6.34E-55
MAPI	2.57E-65
MICE	7.1E-161
RALS	4.7E-108
TGKA	1.68E-12
SQBI	1.7E-118
DVLA	1.93E-97
KLBF	2.55E-98
KAEF	3.13E-84
MERK	#NUM!
PYFA	1.03E-90
CENT	1E-155
CMNP	5.16E-89
FORU	1.31E-66
LMAS	5.1E-106
RUIS	9.99E-81
SCMA	7.14E-66
ANTA	4.51E-52
PANR	1.14E-72
PLIN	8.5E-107
ARTI	1.21E-52
ELTY	2.23E-16
CTRS	3.34E-42
DUTI	1.03E-40
GMTD	7.1E-57
JAKA	2.42E-37
JRPT	2.43E-59
KARK	9.5E-100
KIJA	8.85E-38
KPIG	8.3E-104
LAMI	1.01E-50
LPCK	8.02E-92
LPKR	8.9E-46
MAMI	2.5E-120

MTSM	1.89E-95
BUKK	1
CPIN	0.999247
CTTH	1
ADES	1
SKLT	0.999897
SIPD	1
SUBA	0.999998
ARGO	1
ERTX	1
PAFI	1
TEJA	1
TFCO	1
MYTX	1
ESTI	1
FMII	1
BIMA	1
SIMM	1
DSUC	1
SAIP	1
ETWA	1
POLY	1
KKGI	1
FPNI	1
KICI	1
MLIA	1
LPIN	1
KONI	1
RIMO	1
WICO	1
BMSR	1
MLND	1
PWSI	1
RBMS	1
RODA	1
ABBA	1
DNET	1
INDX	1
ITTG	1
TMPO	1
ASIA	1
ATPK	1

APPENDICE 4

FIRM CODE

CODE	FIRM NAME	CRITERIA
BUKK	PT Bukaka Teknik Utama Tbk	Delisted, loss more than 75% of its paid-up capital
CPIN	PT Charoen Pokphand Indonesia Tbk	loss more than 75% of its paid-up capital in 2004
CTTH	PT Citatah Industry Marmer Tbk	loss in three consecutive years (2003-2005)
ADES	PT Ades Waters Indonesia Tbk	loss more than 75% of its paid-up capital in 2004
SKLT	PT Sekar Laut Tbk	loss more than 75% of its paid-up capital in 2004
SIPD	PT Sierad Produce Tbk	loss in three consecutive years (2003-2005)
SUBA	PT Suba Indah Tbk	loss in three consecutive years (2003-2005)
ARGO	PT Argo Pantes Tbk	loss in three consecutive years (2003-2005)
ERTX	PT Eratex Djaja Tbk	loss in three consecutive years (2003-2005)
PAFI	PT Panasia Filament Inti Tbk	loss in three consecutive years (2003-2005)
TEJA	PT Texmaco Jaya Tbk	loss in three consecutive years (2003-2005)
TFCO	PT TIFICO Tbk	loss in three consecutive years (2003-2005)
MYTX	PT Apac Citra Centertex Tbk	loss in three consecutive years (2003-2005)
ESTI	PT Evershine Textile Industry Tbk	loss in three consecutive years (2003-2005)
FMII	PT Fortune Mate Indonesia TBK	loss in three consecutive years (2003-2005)
BIMA	PT Primarindo Asia Infrastructure Tbk	loss in three consecutive years (2003-2005)
SIMM	Surya Intrindo Makmur Tbk	loss in three consecutive years (2003-2005)
DSUC	PT Daya Sakti Unggul Corporation Tbk	loss in three consecutive years (2003-2005)
SAIP	PT Surabaya Agung Industri Pulp Tbk	loss in three consecutive years (2003-2005)
ETWA	PT Eterindo Wahanatama Tbk	loss in three consecutive years (2003-2005)
POLY	PT Polysindo Eka Perkasa Tbk	loss in three consecutive years (2003-2005)
KKGI	PT Resource Alam Indonesia Tbk	loss in three consecutive years (2003-2005)
FPNI	PT Fatrapolindo Nusa Industry Tbk	loss in three consecutive years (2003-2005)
KICI	PT Kedaung Indah Can Tbk	loss in three consecutive years (2003-2005)

MLIA	PT Mulia Industrindo Tbk	loss in three consecutive years (2003-2005)
LPIN	PT Multi Prima Sejahtera Tbk	loss in three consecutive years (2003-2005)
KONI	PT Perdana Bangun Pusaka Tbk	loss in three consecutive years (2003-2005)
RIMO	PT Rimo Catur Lestari Tbk	loss in three consecutive years (2003-2005)
WICO	PT Wicaksana Overseas International Tbk	loss in three consecutive years (2003-2005)
BMSR	PT Bintang Mitra Semestaraya Tbk	loss in three consecutive years (2003-2005)
MLND	PT Mulialand Tbk	loss in three consecutive years (2003-2005)
PWSI	PT Panca Wiratama Sakti Tbk	loss in three consecutive years (2003-2005)
RBMS	PT Ristia Bintang Mahkotasejati Tbk	loss in three consecutive years (2003-2005)
RODA	PT Roda Panggon Harapan Tbk	loss in three consecutive years (2003-2005)
ABBA	PT Abdi Bangsa Tbk	loss in three consecutive years (2003-2005)
DNET	PT Dyviacom Intrabumi Tbk	loss in three consecutive years (2003-2005)
INDX	PT Indoexchange Tbk	loss in three consecutive years (2003-2005)
ITTG	PT Integrasi Teknologi Tbk	loss in three consecutive years (2003-2005)
TMPO	PT Tempo Inti Media Tbk	loss in three consecutive years (2003-2005)
ASIA	PT Asiana Grain International Tbk	loss in three consecutive years (2003-2005)
ATPK	PT Anugrah Tambak Perkasindo Tbk	loss in three consecutive years (2003-2005)
PWON	PT Pakuwon Jati Tbk	Solvent
TSPC	PT Tempo Scan Pacific Tbk	Solvent
TCID	PT Mandom Indonesia Tbk	Solvent
MRAT	PT Mustika Ratu Tbk	Solvent
UNVR	PT Unilever Indonesia Tbk	Solvent
APOL	PT Arpeni Pratama Ocean Line Tbk	Solvent
BLTA	PT Berlian Laju Tanker Tbk	Solvent
HITS	PT Humpuss Intermoda Transportasi Tbk	Solvent
TMAS	PT Pelayaran Tempurari Emas Tbk	Solvent
RIGS	PT Rig Tenders Tbk	Solvent
SMDR	PT Samudera Indonesia Tbk	Solvent
TIRA	PT Tira Austenite Tbk	Solvent
ARNA	PT Arwana Citramulia Tbk	Solvent
TOTO	PT Surya Toto Indonesia Tbk	Solvent
ASGR	PT Astra-Graphia Tbk	Solvent
MLPL	PT Multipolar Corporation Tbk	Solvent
ACAP	PT Andhi Chandra Automotive Products Tbk	Solvent
ASII	PT Astra International Tbk	Solvent
AUTO	PT Astra Otoparts Tbk	Solvent

BRAM	PT Branta Mulia Tbk	Solvent
GJTL	PT Gajah Tunggal Tbk	Solvent
GDYR	PT Goodyear Indonesia Tbk	Solvent
HEXA	PT Hexindo Adiperkasa Tbk	Solvent
INTA	PT Intraco Penta Tbk	Solvent
ADMG	PT Polychem Indonesia Tbk	Solvent
PRAS	PT Prima Alloy Steel Tbk	Solvent
SMSM	PT Selamat Sempurna Tbk	Solvent
TURI	PT Tunas Ridean Tbk	Solvent
UNTR	PT United Tractor Tbk	Solvent
FASW	PT Fajar Surya Wisesa Tbk	Solvent
AKRA	PT AKR Corporindo Tbk	Solvent
BUDI	PT Budi Acid Jaya Tbk	Solvent
CLPI	PT Colorpak Indonesia Tbk	Solvent
LTLS	PT Lautan Luas Tbk	Solvent
SOBI	PT Sorini Corporation Tbk	Solvent
UNIC	PT Unggul Indah Cahaya Tbk	Solvent
EKAD	PT Ekadharma International Tbk	Solvent
INCI	PT Intanwijaya Internasional Tbk	Solvent
AKKU	PT Aneka Kemasindo Utama Tbk	Solvent
AKPI	PT Argha Karya Prima Industry Tbk	Solvent
AMGF	PT Asahimas Flat Glass Tbk	Solvent
BRNA	PT Berlina Tbk	Solvent
DYNA	PT Dynaplast Tbk	Solvent
IGAR	PT Kageo Igar Jaya Tbk	Solvent
TRST	PT Trias Sentosa Tbk	Solvent
INTP	PT Indocement Tunggal Perkasa Tbk	Solvent
SMGR	PT Semen Gresik (Persero) Tbk	Solvent
BTON	PT Betonjaya Manunggal Tbk	Solvent
CTBN	PT Citra Tubindo Tbk	Solvent
JPRS	PT Jaya Pari Steel Tbk	Solvent
LMSH	PT Lionmesh Prima Tbk	Solvent
LION	PT Lion Metal Works Tbk	Solvent
RDTX	PT Roda Vivatex Tbk	Solvent
DOID	PT Delta Dunia Petroindo Tbk	Solvent
GRIV	PT Great River International Tbk	Solvent
INDR	PT Indo-Rama Synthetics Tbk	Solvent
PBRX	PT Pan Brothers Tex Tbk	Solvent
RICY	PT Ricky Putra Globalindo Tbk	Solvent
BATA	PT Sepatu Bata Tbk	Solvent
TIRT	PT Tirta Mahakam Resources Tbk	Solvent
GGRM	PT Gudang Garam Tbk	Solvent
HMSP	PT HM Sampoerna Tbk	Solvent
ADHI	PT Adhi Karya (Persero) Tbk	Solvent
PTRO	PT Petrosea Tbk	Solvent
AQUA	PT Aqua Golden Mississippi Tbk	Solvent
DAVO	PT Davomas Abadi Tbk	Solvent
DLTA	PT Delta Djakarta Tbk	Solvent
FAST	PT Fast Food Indonesia Tbk	Solvent
INDF	PT Indofood Sukses Makmur Tbk	Solvent

MYOR	PT Mayora Indah Tbk	Solvent
MLBI	PT Multi Bintang Indonesia Tbk	Solvent
PSDN	PT Prasidha Aneka Niaga Tbk	Solvent
SHDA	PT Sari Husada Tbk	Solvent
STTP	PT Siantar Top Tbk	Solvent
TBLA	PT Tunas Baru Lampung Tbk	Solvent
ULTJ	PT Ultrajaya Milk Tbk	Solvent
ANTM	PT Aneka Tambang (Persero) Tbk	Solvent
BUMI	PT Bumi Resources Tbk	Solvent
ENRG	PT Energi Mega Persada Tbk	Solvent
INCO	PT International Nickel Indonesia Tbk	Solvent
MEDC	PT Medco Energi International Tbk	Solvent
PGAS	PT Perusahaan Gas Negara (Persero) Tbk	Solvent
PTBA	PT Tambang Batubara Bukit Asam Tbk	Solvent
TINS	PT Timah Tbk	Solvent
AALI	PT Astra Agro Lestari Tbk	Solvent
UNSP	PT Bakrie Sumatra Plantations Tbk	Solvent
CPDW	PT Cipendawa Agroindustri Tbk	Solvent
MAIN	PT Malindo Feedmill Tbk	Solvent
WAPO	PT Wahana Phonix Mandiri Tbk	Solvent
PJAA	PT Pembangunan Jaya Ancol Tbk	Solvent
PNSE	PT Pudjiadi & Sons Tbk	Solvent
PUDP	PT Pudjiadi Prestige Limited Tbk	Solvent
SMRA	PT Summarecon Agung Tbk	Solvent
SIIP	PT Suryainti Permata Tbk	Solvent
ZBRA	PT Zebra Nusantara Tbk	Solvent
ISAT	PT INDOSAT Tbk	Solvent
IATG	PT Infoasia Teknologi Global Tbk	Solvent
TLKM	PT Telekomunikasi Indonesia (Persero) Tbk	Solvent
AIMS	PT Akbar Indo Makmur Stimec Tbk	Solvent
ALFA	PT Alfa Retailindo Tbk	Solvent
EPMT	PT Enseval Putera Megatrading Tbk	Solvent
FISH	PT FKS Multi Agro Tbk	Solvent
MPPA	PT Matahari Putra Prima Tbk	Solvent
SDPC	PT Millenium Pharmacon International Tbk	Solvent
MAPI	PT Mitra Adiperkasa Tbk	Solvent
MICE	PT Multi Indocitra Tbk	Solvent
RALS	PT Ramayana Lestari Sentosa Tbk	Solvent
TGKA	PT Tigaraksa Satria Tbk	Solvent
SQBI	PT Bristol-Myers Indonesia Tbk	Solvent
DVLA	PT Darya-Varia Laboratoria Tbk	Solvent
KLBF	PT Kalbe Farma Tbk	Solvent
KAEF	PT Kimia Farma (Persero) Tbk	Solvent
MERK	PT MERCK Tbk	Solvent
PYFA	PT Pyridam Farma Tbk	Solvent
CENT	PT Centrin Online Tbk	Solvent
CMNP	PT Citra Marga Nusaphala Persada Tbk	Solvent
FORU	PT Fortune Indonesia Tbk	Solvent
LMAS	PT Limas Centric Indonesia Tbk	Solvent
RUIS	PT Radiant Utama Interinsco Tbk	Solvent

SCMA	PT Surya Citra Media Tbk	Solvent
ANTA	PT Anta Express Tour & Travel Service Tbk	Solvent
PANR	PT Panorama Sentrawisata Tbk	Solvent
PLIN	PT Plaza Indonesia Realty Tbk	Solvent
ARTI	PT Arona Binasejati Tbk	Solvent
ELTY	PT akrieland Development Tbk	Solvent
CTRS	PT Ciputra Surya Tbk	Solvent
DUTI	PT Duta Pertiwi Tbk	Solvent
GMTD	PT Gowa Makassar Tourism Development Tbk	Solvent
JAKA	PT Jaka Inti Realtindo Tbk	Solvent
JRPT	PT Jaya Real Property Tbk	Solvent
KARK	PT Karka Yasa Profilia Tbk	Solvent
KIJA	PT Kawasan Industri Jababeka Tbk	Solvent
KPIG	PT Krida Indahgraha Tbk	Solvent
LAMI	PT Lamicitra Nusantara Tbk	Solvent
LPCK	PT Lippo Cikarang Tbk	Solvent
LPKR	PT Lippo Karawaci Tbk	Solvent
MAMI	PT Mas Murni Indonesia Tbk	Solvent
MTSM	PT Metro Supermarket Realty Tbk	Solvent