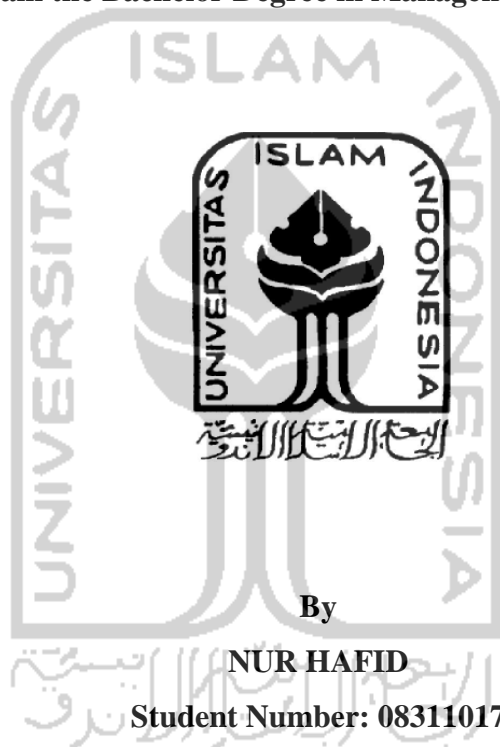


**AN ANALYSIS OF FINANCIAL RATIOS TO PREDICT FINANCIAL
DISTRESS OF MANUFACTURING COMPANIES LISTED ON
INDONESIAN STOCK EXCHANGE (IDX)**

A THESIS

**Presented as Partial Fulfillment of the Requirements
to Obtain the Bachelor Degree in Management Department**



**DEPARTMENT OF MANAGEMENT
INTERNATIONAL PROGRAM
FACULTY OF ECONOMICS
UNIVERSITAS ISLAM INDONESIA
YOGYAKARTA**

2011

DECLARATION OF AUTHENTICITY

Herein I declare the originality of this thesis; I have not presented anyone else's work to obtain my university degree, nor have I presented anyone else's words, ideas or expression without acknowledgement. All quotations are cited and listed in the bibliography of this thesis.

If in the future this statement is proven to be false, I am willing to accept any sanction complying the determined regulation for its consequence.

Yogyakarta, January 31st 2012

Nur Hafid



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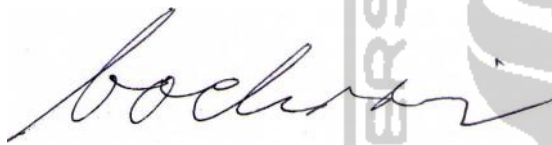
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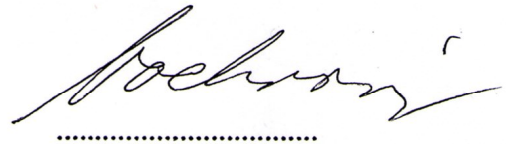
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and Declared Acceptable

Board of Examiners

Examiner 1

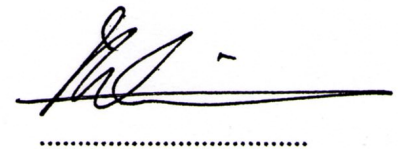
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To all of my friends who always support me to finish this thesis I say thank you very much for accompanying and giving me advice where in class, in faculty, and every where we are discussing it.

This thesis is intended to help students, entrepreneurs, companies and other parties who want to learn how to analyze financial ratios to predict financial distress, especially in manufacturing companies whose shares/stock are listed on stock exchanges.

This thesis consists of five chapters, in which chapters I describes the background, research objectives, and research benefits of using financial ratios as the tool of bankruptcy prediction. Chapter II elaborates the definition of financial statements, the usefulness of financial statements, and how financial ratios can be used as a tool to predict corporate bankruptcy. Chapter III explains how to obtain and collect financial data of the companies and chapter IV of how the data is analyzed by using certain technique as well as its way to calculate. Finally, Chapter V describes the conclusions and recommendations from the research conducted.

The writer realizes that is still far from perfect. Thus the writer would receive any suggestions that will be given by anyone for goodness and perfection of this thesis.

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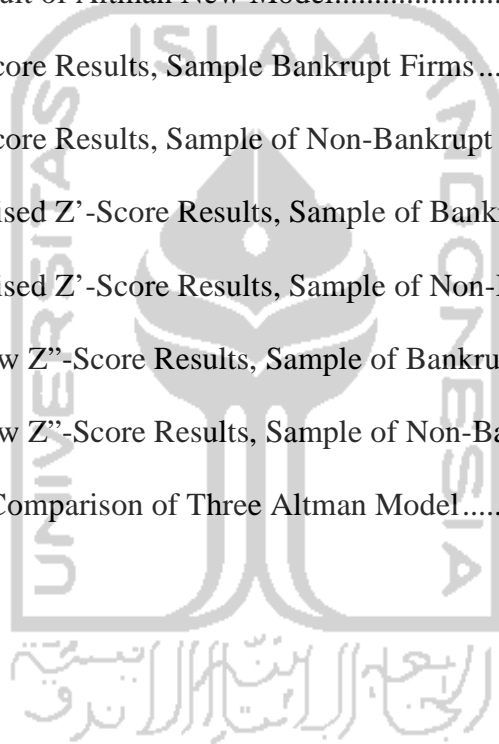
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Abstract

Nur Hafid (2011). An Analysis Of Financial Ratios To Predict Financial Distress Of Manufacturing Companies Listed On Indonesian Stock Exchange (IDX). Yogyakarta, International Program, Universitas Islam Indonesia.

This research aims to analyze the ability of financial ratios to predict financial distress of the manufacturing companies listed on Indonesian Stock Exchange (IDX). For this reason, researcher uses three Altman models which are First Altman Model, Altman Revised Model, and Altman New Model.

This study makes use of the data from 24 companies listed on Indonesia Stock Exchange for the period 2008 to 2010 by purposive random sampling. The companies object divided into two groups. First, Non-Bankrupt group is the manufacturing companies listed on LQ45 Indonesian Stock Exchange. Second, Bankrupt group is the manufacturing companies categorized as Top 20 Losers and delisting companies in Indonesian Stock Exchange. The descriptive research method is used here to describe the data and the research findings.

The result shows that all of Altman model can be used to predict financial distress of manufacturing companies. From the three models, Altman Revised Model is the model that has higher accuracy to predict bankruptcy of manufacturing companies.

Keyword: Financial ratio, Prediction, Bankruptcy, Financial distress, Indonesia Stock Exchange, First Altman Model, Altman Revised Model, and Altman New Model.

Abstraksi

Nur Hafid (2011). An Analysis Of Financial Ratios To Predict Financial Distress Of Manufacturing Companies Listed On Indonesian Stock Exchange (IDX). Yogyakarta, International Program, Universitas Islam Indonesia.

Penelitian ini bertujuan untuk melakukan penelitian tentang kemampuan rasio keuangan untuk memprediksi kesulitan keuangan perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia (BEI). Untuk alasan ini, digunakan tiga model Altman Z-score yaitu Altman model pertama, Altman revisi, dan Altman model baru. Dari ketiga Model ini kemudian dicari keakuratan masing-masing model dan kemudian dibandingkan hasil keakuratannya.

Penelitian ini mengambil data dari 24 perusahaan yang terdaftar di Bursa Efek Indonesia untuk periode 2008-2010 dengan metode purposive sampling dan menggunakan metodologi penelitian deskriptif. Perusahaan yang diteliti terbagi menjadi dua kelompok. Pertama, perusahaan yang dikategorikan tidak bangkrut yaitu perusahaan yang terdaftar di LQ45 Indonesian Stock Exchange. Kedua, perusahaan yang dikategorikan bangkrut yaitu perusahaan yang masuk dalam kategori top 20 loser stock tahun 2010 dan delisting company tahun 2010-2011.

Hasilnya menunjukkan bahwa semua Model altman dapat digunakan untuk memprediksi kebangkrutan. Dari tiga model Altman yang digunakan model Altman revisi adalah model prediksi yang paling akurat dalam memprediksi kebangkrutan perusahaan manufaktur yang terdaftar di Bursa Efek Indonesia.

Keyword: Rasio Keuangan, Prediksi, Kepailitan, Kesulitan Keuangan, Bursa Efek Indonesia, Altman Model Pertama, Altman Revisi, Altman Model Baru.

CHAPTER I

INTRODUCTION

1.1. Study Background

In the world, the cases of companies that suffer from financial distress often emerge. In the USA, prominent companies such as WorldCom, Chrysler, and General Motors suffered financial distress in early 2000s. This condition was caused by the onset of financial difficulties that led to the bankruptcy of the companies. In Indonesia, the phenomenon of financial difficulties also occurred when oil price shock in 2005 and sub-prime mortgage crisis in 2008. In 2005, Indonesian government reduced subsidy for oil price. It caused many companies suffered financial difficulties caused by the increasing of production cost. And in 2008, business activities decline in international market due to global financial crisis and NPL increased again to IDR. 60.6 trillion in March 2009 from IDR.55.4 trillion in November 2008. (<http://www.bi.go.id>).

Talking about manufacturing company, there are a number of growing risks of production disruptions. The disruptions are mostly caused by financial difficulties such as big losses and shortage of cash. One solution to overcome this problem is that a company should know the early warning for a coming year by assessing and analysing its financial statement.

Financial information has the most important role. It is very useful to measure the financial position and the performance of a company in the past, present, and future. Financial statement is very useful to support decision-making especially for managers, payers, boards, lenders, and others who have interest in

the financial health of organizations. From financial statement, an analyst can use company's financial ratios for the purpose of predicting the company performance such as bankruptcy and financial distress.

Financial ratios are numbers obtained from the comparison of one post of financial statements with other relevant headings. Machfoedz (1994) explains that financial ratios are always used in prediction, even absolutely or explicitly. One way in determining if a company does well is to use financial ratio analysis that represents the financial statement analysis. Foster (1986) suggests four things that drive financial statement analysis with a model of financial ratios:

1. To control the influence of magnitude difference between companies or between time.
2. To make the data to be easily assumed by statistical tools.
3. To investigate theories related to financial ratios.
4. To assess the empirical relationship between financial ratios and estimations or predictions of certain variables (such as bankruptcy or financial distress).

Bankruptcy marked by financial distress, is a situation where a company is weak in generating profits or tends to run into deficit. In other words, bankruptcy can be interpreted as a failure in running a company's operations to gain profit. General terms used to describe the situation are bankruptcy, failure, inability to pay off debt, and default. The studies by Hofer (1980) and Whitaker (1999) define financial distress as a condition of the company suffered a net profit (net income) negative for several years. If the financial situation is not resolved immediately,

then the company may fall into bankruptcy. According to Purwanti (2006), bankruptcy is usually defined as a situation where a company fails and is unable to fulfil obligations of debtor due to shortages and insufficient funds. Therefore, analysis and prediction on company's financial condition is very important. By knowing a company's financial distress, anticipation measures can be taken for conditions leading to bankruptcy.

A company makes financial statements and its disclosure with the purpose of providing useful information for decision making in investment and financing, as stated in SFAC No. 1 that the financial statements must provide the following information:

1. Investment and credit,
2. Amount and timing of cash flows,
3. Assets and liabilities,
4. Company's performance,
5. The sources and uses of cash,
6. Explanatory and interpretive information, and
7. Stewardship evaluation.

These seven goals are summarized by the presentation of income statement, balance sheet, cash flow statements and financial statement disclosures.

The importance of analysing the financial statements of a company is its usefulness to predict continuity or survival of the company. Prediction of survival is very important for management companies and owners of the company to anticipate the possibility of a potential bankruptcy.

Various studies have been conducted to assess the benefits that can be gleaned from the analysis of financial ratios. Research conducted by Altman (1968) is an initial study that examines the use of financial ratio analysis as a tool to predict corporate bankruptcy. At his first model, Altman stated that if a company has bankruptcy index or 2.99 or more, then it is not categorized into companies going to bankrupt. Meanwhile, a company with bankruptcy index of 1.81 or less, it will be included in bankrupt category. Altman found five financial ratios that can be used to detect the company's bankruptcy two years before it goes bankrupt. The five ratios consist of: working capital to total assets, retained earnings to total assets, EBIT to total assets, market value of equity to book value of total liabilities, and sales to total assets. Altman also found that certain ratio mainly liquidations and leverage give biggest contribution in order to detect and predict corporate bankruptcy. The model is known as the Altman Z-Score, that is the score determined from the count of times the standard ratio - financial ratio that shows the possibility of corporate bankruptcy. One disadvantage of Altman Z-score model is situated on the use of EBIT ratio. Disclosure and financial reporting among companies with one another are usually different. In certain companies sometimes high cost of interest is not stated explicitly so that EBIT is difficult to be applied, therefore the company must use EBT (Earnings Before Tax), and this could lead to the diversity of EBIT data.

Many individuals and groups have interest in the success and failure of a manufacturing company. The internal party and employees of a company have an interest in the company's management and survival. External parties such as

investors can compare, analyse, and conclude that information, so they can take appropriate decisions in accordance with the conditions of manufacturing companies.

Based on those phenomena, the writer would like to conduct a research with the title: “**An An Analysis Of Financial Ratios To Predict Financial Distress Of Manufacturing Companies Listed On Indonesian Stock Exchange (IDX)**”.

1.2. Problem Identification

Companies that suffer losses, unable to pay its obligations or illiquid may require restructuring. To know the symptoms of bankruptcy, the user needs a model to predict financial distress in order to avoid a loss in value of investments. This research will examine whether First Altman Model, Altman Revised Model and Altman New Model that used financial ratios as the variable are accurate in predicting financial distress.

1.3. Problem Formulation

Based on the previous explanation, the problem formulations are:

1. Are three bankruptcy prediction models (First Altman Model, Altman Revised Model and Altman New Model) accurate in predicting financial distress?
2. Which Altman model that have higher accuracy in predicting financial distress?

1.4. Problem Limitation

All data used in this research are quantitative data. The type of this data is secondary data which is taken from Indonesian Stock Exchange. As Indonesian Stock exchange contains a large number of data, the scope of the data is required to be restricted:

1. The data being used are published in Indonesian Stock Exchange for the period 2008-2010.
2. Companies becoming the samples are manufacturing companies listed continuously on LQ-45 Indonesia Stock Exchange (IDX) for the period 2008-2010 and the companies categorized in to group of top 20 losers for period January-December 2010.
3. Financial ratios used in this research are working capital to total assets, retained earnings to total asset, earnings before interest and to total assets, market value of equity to book value of total liabilities and sales to total assets.

All data are reported and presented in Indonesian Stock Exchange Directory.

1.5. Research Objectives

The objective of this research is to develop three Altman models to predict financial distress among industries. In addition, the contribution of this research is to provide information for internal and external parties regarding the company's financial ratios are highly dominant in predicting financial distress.

1.6. Research Benefits

This research study can be very useful in analysing the probability of a company to get default. Hopefully by conducting such research, a company can reduce risk and uncertainty before investing in any business form. Beside the advantage for companies, this study can be the reference for other researchers to conduct the same sort of research. In addition, from educational point of view, this research is expected to improve the critical and analytical thinking of business and economic students. More than that, it can be a significant contribution to economics syllabus.

1.7. Definition of Terms

Key Word: Company Financial Ratio in Indonesian Stock Exchange. The writer will elaborate about Financial Ratio in Indonesian Stock Exchange.

Financial Ratios are tools to measure the financial performance of a company. There are varieties of financial ratio, but in this research, they are limited to financial ratios used working capital to total assets, retained earnings to total asset, earnings before interest and to total assets, market value of equity to book value of total liabilities and sales to total assets.

Financial distress is a situation where a company is weak in generating profits or tends to run into deficit. In other words, bankruptcy can be interpreted as a failure in running a company's operations to gain profit. General terms used to describe the situation are bankruptcy, failure, inability to pay off debt, and default. The studies by Hofer (1980) and Whitaker (1999) define financial distress

as a condition of the company suffered a net profit (net income) negative for several years. If the financial situation is not resolved immediately, then the company may fall into bankruptcy

Indonesian Stock Exchange is a place where shares are traded. People can get information related to stock in Indonesia in Indonesian Stock Exchange. Indonesia Stock Exchange abbreviated as BEI, or Indonesia Stock Exchange (IDX) is an exchange result of the merger between Jakarta Stock Exchange (JSX) and Surabaya Stock Exchange (SSX). For the operational effectiveness and transactions, the Government decided to merge Jakarta Stock Exchange as the stock market with Surabaya Stock Exchange as bonds and derivatives markets. The merger began operating on December 1, 2007. BEI has made use of a trading system called Jakarta Automated Trading System (JATS) since May 22, 1995, replacing the manual system used before. Since March 2, 2009 JATS system itself has been replaced with a new system called JATS-NextG provided by OMX. Indonesia Stock Exchange is based in Sudirman Trading Area Jl. Jend. Sudirman 52-53, Senayan, Kebayoran Baru, South Jakarta.

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1. Financial Difficulties and Bankruptcy

Bankruptcy of a company marked by financial distress is a condition where the company is weak in generating profits or companies tend to run into deficit. In other words, bankruptcy could be interpreted as a failure in running the company's operating companies to gain profit. Bankruptcy is also often called liquidation of the company or enterprise closing or insolvency.

Plate and Plate (2002) defines financial distress as a stage of decline in financial condition that occurs prior to the bankruptcy or liquidation. Financial distress is the situation when a company does not have capacity to fulfil its liabilities to the third parties (Andrade and Kaplan, 1998).

To overcome and minimize the occurrence of bankruptcy, the company can oversee financial condition by using the techniques of financial statement analysis. Analysis of financial statements is an important tool for obtaining information relating to the company's financial position and results achieved in connection with the election of corporate strategy that has been applied. By performing the analysis of company financial statements, it is known financial condition and development of company. Moreover, it also can be known weaknesses and the results are considered quite good and the potential bankruptcy of the company.

2.2. Financial Statement

Financial statement is the report of financial information in certain accounting period that can be used to describe the financial position, performance and changes in financial position of a company. It benefits users of financial statements in making economic decisions. There are several definitions of financial statement. According to Munawir (2000:2), financial statement is the result of accounting process that can be used as a tool for communication between financial data or activity of a company with parties that have interest in funds or activities of the company. Meanwhile, according to Harnanto (1995:28), financial statement is a formal form used as the tool of communication between a company with the owner and other parties who have interest in it.

2.3. The User of Financial Statement

Parties who have interest in financial statement and the development of an enterprise are (Munawir, 2004):

1. Company Owner

A company's owner gives authority to managers; require financial statement to assess the performance of managers in leading his company. And the success of the managers is measured or assessed by the profits the company has earned. These measurement and assessment are based on the analysis of financial statements. If the result achieved by the managers is not satisfactory, then the owner of the company can take an action such as change management or even sell the shares owned.

2. Manager

For a manager, financial statement is a tool of accountability to a company owner for the trust given. In addition, it is used to measure the level of costs for various activities of a company, and assess the work of each division.

3. Creditors

Before making a decision to grant or deny credit request, lenders need to know in advance the financial position of a company. The financial statement required is to measure a company's ability to pay debt, interest charges and also to decide credit guarantee.

4. Investors

Investors are interested in financial statements of a company's capital investment as the determination of policy, whether the company has a good prospect and will make a good profit. The prospect of future profits and growth of a company then are used to determine collateral investments.

5. Government

A government has interest in a company's financial statements to determine the amount of tax to be paid by the company.

6. Employees

Employees require financial statements to determine the company's ability to provide wage/salary and social security and to assess if bonus is quite reasonable compared to company's profit level achieved over a period of time.

In general, functions of financial information are useful information for decision making in credit and investment; useful information for predicting cash flow; and information about company's economic sources (Harnanto, 1995:5).

2.4. Objectives of Financial Statements

A company makes financial statements and their disclosure with the purpose of providing useful information for decision making in investment and financing, as stated in SFAC No.1 that the financial statements must provide the followings information:

1. Investment and credit,
2. Amount and timing of cash flows,
3. Assets and liabilities,
4. Company's performance,
5. The sources and uses of cash,
6. Explanatory and interpretive information, and
7. Stewardship evaluation.

These seven goals are summarized by the presentation of income statement, balance sheet, cash flow statements and financial statement disclosures.

Statement of Financial Accounting Concepts (SFAC) No. 1 Objective Financial Reporting by Business Enterprises (FSAB 1978) states that general purpose of financial reporting is to provide useful information for current investors, potential investors and creditors in making rational investment decisions and credit decisions. *SFAC No. 2 Qualitative Characteristics of*

Accounting Information explains that one of the qualitative characteristics that should be owned by accounting information for financial reporting purposes can be achieved is the ability of prediction (FSAB 1980).

2.5. Qualitative Characteristics of Financial Statements

Qualitative characteristics of financial statements according to PSAK (2007) are characteristics that make the information in the financial statements useful for users. There are four principal qualitative characteristics:

1. Can be understood

The important quality of information that is collected in financial statements is its simplicity to be understood by users.

2. Relevant

In order to be useful, information must be relevant to meet the needs of users in the decision making process. Relevant information has the quality that users can influence the economic decisions by helping them evaluate past, present or future events, and confirm or correct the results of their evaluations in the past.

3. Reliability

In order to be useful, information has to be reliable. It is free from misleading, material error and on which users can rely on it as an honest presentation.

4. Can be compared

Users have to be able to compare financial statements between periods to identify trends - the position and financial performance. Users also should be able to compare financial statements between companies to evaluate financial position, performance and changes in financial position relatively.

2.6. Components of Financial Statements

Complete financial statements consists of the following components:

1. Balance Sheet
2. Income statement
3. Changes in equity
4. statements of cash flows
5. Notes to financial statement

1. Balance Sheet

Balance sheets are presented in such a way that describes a company's financial position at a given point. The function is to show financial situation at a specific date usually at the time of closing the books. Balance sheets include the postal minimum - the following post (IAI, 2004):

- a) Tangible assets,
- b) Intangible assets,
- c) Financial assets,
- d) Investments treated using the equity method,

- e) Inventories,
- f) Accounts receivable and other receivables,
- g) Cash and cash equivalents,
- h) Payables and other payables,
- i) The obligation estimated,
- j) Interest of long-term liabilities,
- k) Minority interest,
- l) Capital stock and other equity.

2. Income statement

Income statement is a report that shows revenue from sale, variety of costs, and profits derived by a company over period of time. Forms of income statement:

a) Multiple-step

The formulation of income statement is prepared step by step from the group of revenues and expenses, non operation group of revenue and expenses and other revenues and expenses. This multiple-step form is widely used in trading companies or industrial companies.

b) Single-step

In the form of single step, all kinds of income (operating income, and non operating income and other income) are compiled and added in one group then reduced by the number of all types of expenses. The difference in the amount of income from the amount of expenses is profit or loss. This form is widely used in service companies.

3. Changes in Equity

Changes in equity present the increase and the decrease in net assets or wealth of a company during a period of time based on particular measurement principles adopted and written in financial statements.

4. Statements of cash Flow

Statement of cash flows should be prepared on the cash during a reporting period. Cash and cash equivalent consist of cash, demand deposit from BI and demand deposit of other banks.

5. Notes to Financial Statements

Notes to financial statements must be presented systematically. Each item on a balance sheet, income statement and statement of cash flows requires explanation and should be supported by information included in notes to financial statements.

2.7. Limitation of Financial Statement

Financial Statements have a limitation, among others:

1. Financial statements are made periodically in the essence of internal report (the report is made during temporary time) and not a final report, because there are numbers that are not reported.
2. Financial report shows the number of dollars that seems to be definite and precise, but in fact the basic formulation with standard value may differ or change.

3. Financial statements are prepared based on the results of recorded financial transactions or the value of Rupiah at various times. The value of rupiah represents purchasing power of money that progressively decreased, compared with previous years. The value of rupiah may increase if it is caused by rising prices of goods.
4. Financial statements do not reflect the various factors that can affect the position or the financial condition of a company because factors cannot be measured in units of money.

2.8. Analysis of Financial Statements to Predict Financial Distress

Analysis of financial statements includes the study of the relationship and the tendency or trend to determine whether benefit, results of operations and financial progress of the company is satisfactory or unsatisfactory. The analysis is conducted by measuring the relationship between the elements of financial statements and how each element has changed from year to year to determine the direction of its development. In analyzing a company's financial statements, certain size is required. Size used in financial statement analysis is ratio. Financial ratios are the number obtained from the comparison of one post of financial statements with other posts that have relevant relationship. With financial ratios, it would provide information that describes the relationship between certain items with other items. Thus, from financial statement, an analyst can use company's financial ratios for the purpose of predicting the company performance such as bankruptcy and financial distress.

2.9. Financial Ratio Analysis

Dennis (2006) stated that financial ratio analysis is the best method used to obtain a picture of the company's overall financial condition. According to Usman (2003), this analysis is useful as an internal analysis for corporate management to know the financial results achieved in order to create the future planning. This analysis is also useful for the internal analysis of creditors and investors to determine lending policy and an investment of the company. This financial ratio analysis can be divided into two types based on the variate used in the analysis, which is Ang, 1997):

1. *Univariate Ratio Analysis*

Univariate Ratio Analysis is the analysis of financial ratio using single variate in the analysis. For example, *Profit Margin Ratio*, *Return On Asset* (ROA) dan *Return On Equity* (ROE).

2. *Multivariate Ratio Analysis*

Multivariate Ratio Analysis is the analysis of financial ratio that use more than one variate in conducting the analysis. For example, Alman's Z-Score dan Zeta Score.

Financial ratio is a comparison of two data contained in company financial statements. Financial ratios are used by creditors to determine the performance of a company by looking in the company's ability to pay its debts (Dennis, 2006). In general, financial ratios can be classified into four types, such as:

1) Liquidity Ratio

This ratio indicates the ability of companies to solve their short-term liabilities (less than one year). According to Munawir (2004), liquidity ratios can be divided into three:

- a. Current Ratio (CR) is the ratio between current assets and current liabilities
- b. Quick Ratio (QR) is the ratio between current assets reduced by inventory to current liabilities.
- c. Working Capital to Total Assets (WCTA) is the ratio between current assets reduced by current liabilities to total assets.

In this study the ratio of liquidity is proxy by WCTA, because according to previous research, this ratio is the most influential ratio on profit growth. WCTA can be formulated as follows (Riyanto, 1995):

$$WCTA = \frac{\text{current asset} - \text{current liabilities}}{\text{total asset}}$$

Current assets consist of cash, inventories and account receivables (income from trading). Current liabilities consist of account payable, taxes payable and current maturities of long term debt. Total assets is the sum of current assets with fixed assets (ICMD 2004).

2) Solvability/Leverage Ratio

This ratio indicates a company's ability to meet its long-term liabilities. This ratio can be proxy with (Ang, 1997, Mahfoedz, 1994 and Ediningsih, 2004):

- a. Debt Ratio (DR) is the ratio between total debt to the total assets

- b. Debt to Equity Ratio (DER) is the ratio between the amount of current debt and long-term debt to its capital .
- c. Long Term Debt to Equity Ratio (LTDER) is the ratio between long-term debts to equity.
- d. Times Interest Earned (TIE) is the ratio between earnings before tax (EBIT) to interest of long-term debt.
- e. Current Liability to Inventory (CLI) is the ratio between current debts to stock.
- f. Operating Income to Total Liability (OITL) is the ratio between operating income before interest and tax (net sales reduced by cost of goods sold and operating expenses) to total liability.

In this research leverage ratio is proxy with CLI and OITL, because according to the previous research, these ratios are the most influential on profit growth. CLI can be formulated as follows (Machfoedz, 1994).

$$CLI = \frac{\text{current liabilities}}{\text{inventory}}$$

Supplies (inventory) in question are commodities or goods purchased by a company to be sold again. Examples include: raw materials, operating supplies (goods used in production but the company does not become part of the final product, such as fuel), spare parts (manufactured goods purchased by another company to produce a product, such as tires for a car factory, rope for a shoe factory) (Reksoprayitno, 1991).

OITL can be formulated as follows (Riyanto, 1995):

$$OITL = \frac{\text{Operating profit before interest and taxes}}{\text{Total Liabilities}}$$

Operating profit before interest and taxes is net sales reduced by cost of goods sold and operating expenses. The amount of liabilities in question is the sum of current debt and the debt remains (ICMD 2004).

3) Activity Ratio

According to Ang (1997) this ratio shows the ability and efficiency in utilizing company owned assets or turnover of assets. The ratio of activity can be proxy with:

- a. Total Assets Turnover (TAT) is the ratio between the net sales to total assets
- b. Inventory Turnover (IT) is the ratio between the cost of goods sold to average inventory
- c. Average Collection Period (ACP) is the ratio between the average accounts receivables multiplied by 360 divided with credit sales.
- d. Working Capital Turnover (WCT) is the ratio between the net sales to working capital.

In this research activity ratio is proxy by Total Assets Turnover (TAT), because according to the previous research, this ratio is the most influential on profit growth.

TAT can be formulated as follows (Ang, 1997).

$$TAT = \frac{Sales}{Total Asset}$$

Net sales is the result of net sales for one year. Total asset is the sum of current assets and fixed assets.

4) Profitability Ratio

According to Husnan and Pudjiastuti (1994), the ratio of profitability/rentability is used to measure the efficiency of a company from using its assets. Efficiency is an attribute to successful sales achieved. Profitability ratios can be proxy by:

- a. Net Profit Margin (NPM) is the ratio between net incomes after tax (NIAT) to total sales.
- b. Gross Profit Margin (GPM) is the ratio between gross profits to net sales.
- c. Return on Assets (ROA) is the ratio between net incomes to total assets.
- d. Return on Equity (ROE) is the ratio between the incomes after tax to capital.

In this research profitability ratio is proxy by NPM and GPM, because according to the previous research, these ratios are the most influential on profit growth. NPM can be formulated as follows (Ang, 1997).

$$NPM = \frac{net\ income\ after\ tax}{net\ sales}$$

Net income after tax is calculated from net income before tax reduced by income tax. Net sales show the result of sales received by the company from sales of merchandise or the results of its own production (Reksoprayitno, 1991). GPM can be formulated as follows

$$GPM = \frac{\text{gross profit}}{\text{net sales}}$$

Gross Profit can be calculated from net sales reduced by cost of goods sold.

Altman collected the 22 ratios most frequently used in various studies and researches in the past. From these 22 ratios finally Altman chose five ratios through various statistical procedures, observations and judgments. The five variables are:

I. Working Capital / Total Assets (WC / TA)

This ratio measures a company's net current asset relative to its total capitalization. Typically, companies that suffer losses continue to decline in the ratio of current assets to total assets.

2. Retained Earnings/Total Assets (RE/TA)

Retained earnings is an account which shows the accumulated amount of reinvested earnings during a company's life. In this case, newly –established companies will most likely show RE / TA lower than old-established ones. So there is an argument that this is not fair to use retained earnings in assessing the risk of bankruptcy. In further review, this fact describes the state of the real world, a company's failure usually occurs when it is firstly built.

3. Earnings Before Interest and Taxes/Total Assets (EBIT/TA)

This ratio measures the actual productivity of the use of corporate assets. Company's ability to survive is highly dependent on the earning power of its assets; therefore this ratio is highly suitable for use in analysing the risk of bankruptcy.

4. Market Value of Equity/Book Value of Total Liabilities (MVE/TL)

This ratio can be used to measure how much decrease of a company's assets can be accepted. If liabilities exceed the assets of a company, it will lead to bankruptcy. The greater the tolerance of acceptable decreasing asset, the smaller the probability to bankruptcy.

5. Sales/Total Assets (S/TA)

This ratio indicates the ability to use corporate assets to generate sales, this ratio also measures the ability of management in facing competition. As competition is a threat faced by all businesses to survive and thrive, this ratio is very important in the analysis of the risk of bankruptcy.

2.10. Financial Distress Prediction

Altman (1968) used discriminant analysis to develop a model to predict corporate bankruptcy. Multivariate Discriminant Analysis (MDA) used by Altman is a technique that produces an index that allows the classification of an observation into one of several groupings which are a priori, as an example in this case is to classify whether a company is not bankrupt or bankrupt.

Altman chose five ratios through various statistical procedures, observations and judgments. The five variables are Working Capital /Total Assets, Retained Earnings/Total Assets, Earnings Before Interest and Taxes/Total Assets, Market Value of Equity/Book Value of Total Liabilities, and Sales/Total Assets.

Through MDA to the five variables, Altman get the discriminant function that is called as Z-score model. In a further study by Altman, this model has developed from the first model of Altman, to be Altman Revised Model and Altman New Model.

1.10.1. First Altman Model

After conducting research on the selected variables and samples, Altman make the first bankruptcy model which is intended to predict the bankruptcy of a public manufacturing company. The equation of the first Altman model:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

Where

X₁ = working capital/total assets,

X₂ = retained earnings/total assets,

X₃ = earnings before interest and taxes/total assets,

X₄ = market value equity/book value of total liabilities,

X₅ = sales/total assets, and

Z = bankruptcy index.

1. Companies with Z value > 2.99 are those less likely to go bankrupt.
2. Companies with Z value between 1.81 and 2.99 (= 1.81 <Z <2.99) are those in a state of gray areas.
3. Companies with Z value <1.81 are those that will definitely go bankrupt.

1.10.2. Altman Revised Model

Then Altman revise the first Z-score model. A revision made by Altman is an adjustment made to the bankruptcy prediction. It is not only be applied for manufacturing companies that go public but it can also be applied to companies in the private sector. There is a change in variable used. Altman change the numerator Market Value of Equity of X4 into book value of equity because private firms have no market price for its equity.

$$Z' = 0.717X1 + 0.847X2 + 3.108X3 + 0.42X4 + 0.988X5$$

Where

- X1 = working capital/total assets,
- X2 = retained earnings/total assets,
- X3 = earnings before interest and taxes/total assets,
- X4 = book value equity/book value of total liabilities,
- X5 = sales/total assets, and
- Z' = bankruptcy index.

1. Companies with Z' value > 2.9 are those less likely to go bankrupt.
2. Companies with Z' value between 1.23 and 2.9 (= 1.81 <Z <2.99) are those in a state of gray areas.
3. Companies with Z' value <1.23 are those that will definitely go bankrupt.

1.10.3. Altman New Model

Along with time and adjustment to various types of companies, Altman then modify the model to be applied to all companies, such as manufacturing company, non-manufacturing company, and corporate bond issuers in developing countries (emerging market). In Altman New Model, Altman eliminates the variable X5 (sales / total assets.) because this ratio is very varied in the industry with the different size of assets.

$$Z'' = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$$

Where

- X1 = working capital/total assets,
- X2 = retained earnings/total assets,
- X3 = earnings before interest and taxes/total assets,
- X4 = book value equity/book value of total liabilities,
- Z'' = bankruptcy index.

1. Companies with Z'' value > 2.6 are those less likely to go bankrupt.
2. Companies with Z'' value between 1.1 and 2.6 (= 1.81 <Z <2.99) are those in a state of gray areas.
3. Companies with Z'' value <1.1 are those that will definitely go bankrupt.

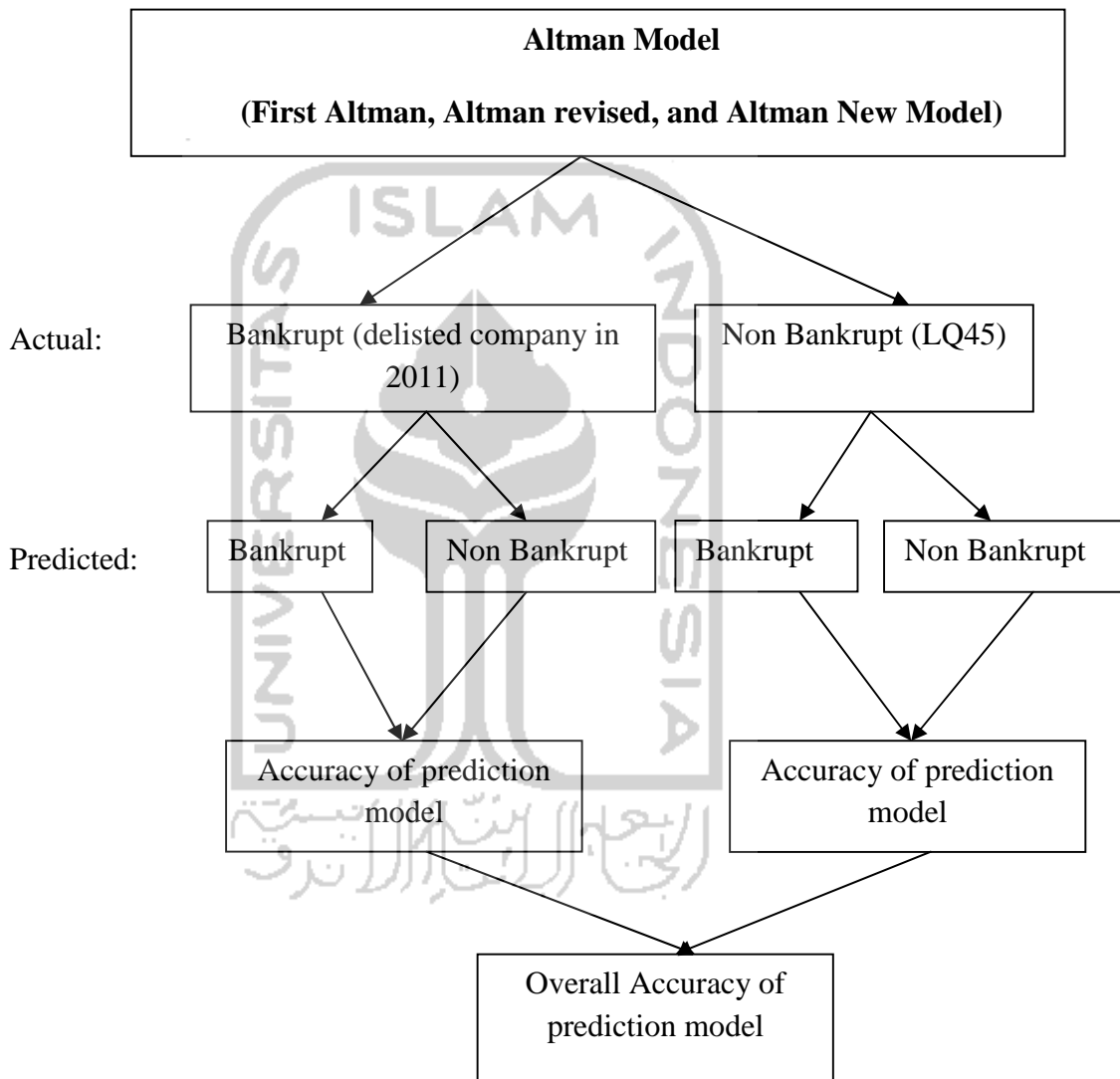
2.11. Hypothesis Formulation

Ha₁: First Altman Model is accurate in predicting financial distress.

Ha₂: Altman Revised Model is accurate in predicting financial distress.

Ha₃: Altman New Model is accurate in predicting financial distress.

Based on literature reviews developed above, presented a conceptual model which is reflected in the Framework of Theoretical Thought as shown in the figure:



CHAPTER III

RESEARCH METHOD

3.1. Research Methodology

This research uses descriptive studies that have goal to explain three bankruptcy prediction models and analyze the accuracy of each model. So it can be concluded whether company financial ratio used in Altman Z-score model is accurate in predicting predict financial distress of manufacturing companies and which Altman Z-Score model that has higher accuracy.

3.2. Population and Sample

The population in this research is manufacturing companies that the stock is listed IDX in the period of 2008-2010. The sampling technique used is purposive sampling which the criteria, as follows:

1. Bankrupt company taken from categories of Top 20 losers and delisting company which Shares are listed in Indonesia Stock Exchange (IDX) during period of 2008-2010.

Table.3.1 Total Samples of Bankrupt Companies

Top 20 losers	11 non manufacturing companies
	9 manufacturing companies
Delisted companies	3 manufacturing companies
Total	12 manufacturing companies

2. Non-bankrupt company which the Shares are listed continuously in LQ-45 Indonesia Stock Exchange (IDX) during period of 2008-2010.

Table.3.2 Total Samples of Non-Bankrupt Companies

LQ45	33 non manufacturing companies
	12 manufacturing companies
Total	12 manufacturing companies

Base on those criteria, the companies taken are as follows:

Table 3.3 List of company code and name

Sample Group I (bankrupt firm)

NO	Company Name	code	explanation
1	Akasha Wira International Tbk	ADES	Top 20 losers 2010
2	Dynaplast Tbk	DYNA	Delisted in 2011
3	Intikeramik Alamasri Industri Tbk	IKAI	Top 20 losers 2010
4	Indah Kiat Pulp & Paper Tbk	INKP	Top 20 losers 2010
5	Itamaraya Tbk	ITMA	Top 20 losers 2010
6	Kertas Basuki Rachmat Ind. Tbk	KBRI	Top 20 losers 2010
7	Muliaglass	MLSS	Delisted in 2010
8	Pakuwon Jati Tbk	PWON	Delisted in 2011
9	Prasidha Aneka Niaga Tbk	PSDN	Top 20 losers 2010
10	Surabaya Agung Industry Pulp Tbk	SAIP	Top 20 losers 2010
11	Sumalindo Lestari Jaya Tbk	SULI	Top 20 losers 2010
12	Ultra Jaya Milk Tbk	ULTJ	Top 20 losers 2010

Sample Group II (non-bankrupt firm)

NO	Company Name	code	explanation
1	Astra International Tbk	ASII	LQ 45
2	Bakrie & Brothers Tbk	BNBR	LQ 45
3	Barito Pacific Tbk	BRPT	LQ 45
4	Berlian Laju Tanker Tbk	BLTA	LQ 45
5	Gudang Garam Tbk	GGRM	LQ 45
6	Holcim Indonesia Tbk	SMCB	LQ 45
7	Indocement Tunggal Prakarsa Tbk	INTP	LQ 45
8	Indofood Sukses Makmur Tbk	INDF	LQ 45
9	Kalbe Farma Tbk	KLBF	LQ 45
10	Semen Gresik Tbk	SMGR	LQ 45
11	Unilever Indonesia	UNVR	LQ 45
12	United Tractor	UNTR	LQ 45

3.3. Data Sources

Data used in this study are secondary data consisting of financial ratios taken from company's financial statement which are:

1. $X1 = \text{Working Capital} / \text{Total Assets (WC / TA)}$
2. $X2 = \text{Retained Earnings} / \text{Total Assets (RE / TA)}$
3. $X3 = \text{Earnings before Interest and Taxes} / \text{Total Assets (EBIT / TA)}$
4. $X4 = \text{Market Value (Book value) of Equity} / \text{Book Value of Total Liabilities (BVE / TL)}$
5. $X5 = \text{Sales} / \text{Total Assets (S / TA)}$

3.4. Method of Data Collection

Data needed in this research is secondary data obtained through media intermediaries or data obtained and recorded by others. The data used in this study is the accounting data of the sample company's financial statements: Income Statement and Balance Sheet and financial ratios-year period 2008-2010 taken from IDX and company website.

Data collection methods used in this study is the method of documentation, which is a technique of collecting data by using journals, books, and view and retrieve the company's financial statements in the IDX website. This is intended to obtain data on the balance sheet and income statement and financial ratios sampled during the period 2008 to 2010

3.5. Steps in Data Analysis

3.5.1. Calculating Financial Ratios-Ratios.

Calculate financial ratios from Altman's bankruptcy prediction model, which includes:

- $X1 = \text{Working Capital} / \text{Total Assets (WC / TA)}$
- $X2 = \text{Retained Earnings} / \text{Total Assets (RE / TA)}$
- $X3 = \text{Earnings before Interest and Taxes} / \text{Total Assets (EBIT / TA)}$
- $X4 = \text{Market Value (Book value) of Equity of Equity} / \text{Book Value of Total Liabilities (BVE / TL)}$
- $X5 = \text{Sales} / \text{Total Assets (S / TA)}$

These ratios will be calculated based on financial statements of manufacturing companies listed on the Indonesia Stock Exchange for the period 2008 - 2010 in order to obtain a set of financial ratios.

3.5.2. Classifying the Company Base on the Prediction

After calculating Z- score ratio through the calculation of ratio-ratio above, then the Company will be classified into three categories namely:

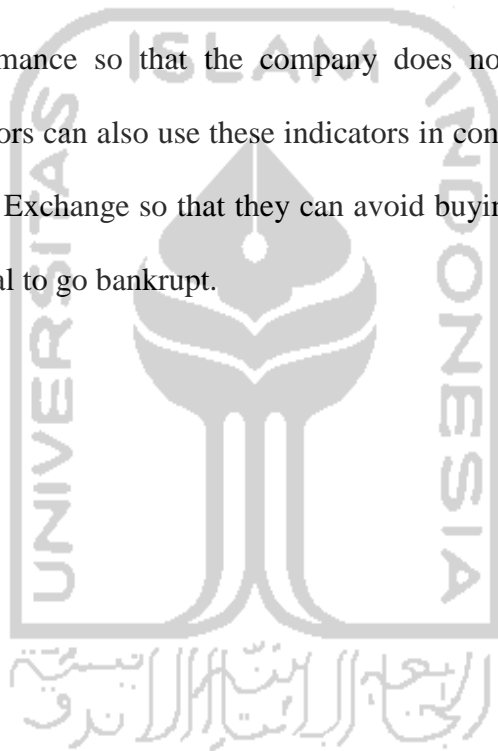
- a) Companies that is not included in the bankrupt condition ($Z > \text{min cutoff value}$)
- b) Companies included in the bankrupt condition ($Z < \text{min cutoff value}$).

3.5.3 Comparing the Actual and the Prediction

After the companies are classified into a group of bankrupt or not bankrupt then the result of prediction will be compared with the actual condition of the company. It will be obtain the number of company that correctly goes bankrupt and the number of companies that are not correctly going to be bankrupt. Then will be obtain the percentage of accuracy of each Altman model base on the ratio of number of correct prediction with the total sample. Finally it can be compare which Altman model that has higher accuracy in predicting the bankruptcy.

3.5.4 Strategy implications

After calculating Altman Z-score, classifying the company, and comparing three model of Altman Z-score, it will be conclude which Altman model fit to be used in predicting manufacturing companies. Altman model provides an early warning about the condition of the company's financial health. From the model given in the form of indicators of financial ratios of companies to improve financial performance so that the company does not to fall into bankruptcy. Logically investors can also use these indicators in conducting transactions on the Indonesia Stock Exchange so that they can avoid buying stocks the company that have the potential to go bankrupt.



CHAPTER IV

DATA ANALYSIS

4.1 Data Description

This research has been started by studying the literature, journals, and websites to get the relevant topic. The objects of the research are manufacturing companies listed on Indonesia Stock Exchange for period 2008-2010, amounting to 24 companies. With the data criteria:

- a. The initial sample is composed of 24 companies categorized into two groups of bankrupt companies (Group I) and non-bankrupt companies (Group II). Group I are manufacturing companies from categories of top 20 losers in January-December 2010 and delisting company in 2010-2011 which Shares are listed in Indonesia Stock Exchange (IDX) during period of 2008-2010. Meanwhile, Group II are manufacturing companies which these Shares are listed continuously in LQ-45 Indonesia Stock Exchange (IDX) for period 2008-2010.
- b. The data include: Working Capital /Total Assets, Retained Earnings/Total Assets, Earnings Before Interest and Taxes/Total Assets, Market Value of Equity (Book Value of Equity)/Book Value of Total Liabilities, and Sales/Total Assets.

4.2. Research Process

The company become sample consists of two groups of bankrupt companies (Group I) and Non-bankrupt (Group II) companies. After the initial groups are defined and firms selected, balance sheet and income statement data are collected to calculate financial ratios required in Altman Z-score model.

The next process is calculating Z-score ratio through the calculation of ratio-ratio above. The result of prediction will be compare with the actual condition of the company. It will be obtain the number of company that correctly goes bankrupt and the number of companies that are not correctly going to be bankrupt. Then will be obtain the percentage of accuracy of each Altman model base on the ratio of number of correct prediction to total sample. Finally it can be compare which Altman model that has higher accuracy in predicting the bankruptcy.

4.3. Data Analysis Result and Discussion

Base on the research methodology, the researcher then collect and process data by calculating Z-score of each companies. From group of bankrupt (Group I) and group of non-bankrupt (Group II), the result shows that there is a different between the actual condition and the prediction.


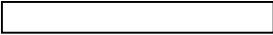


Detail data predictions from year to year are as follows:

	(Actual)	(Predicted)
• 2008 → 2011 24 companies	12 Bankrupt	xx
	12 Non-bankrupts	xx
• 2008 → 2011 24 companies	12 Bankrupt	xx
	12 Non-bankrupts	xx
• 2008 → 2011 24 companies	12 Bankrupt	xx
	12 Non-bankrupts	xx
Total data	72 data	xx

This table shows the result of prediction for Altman First Model in 2008-2010:

Table 4.1 Z-Score Result of Altman First Model





NO	Company Name	code	A first z score			
			2008	2009	2010	Total
Bankrupt companies			Prediction			
1	Akasha Wira International Tbk	ADES	-3.37 B	-3.29 B	-2.47 B	
2	Dynaplast Tbk	DYNA	0.52 B	0.93 B	1.46 B	
3	Intikeramik Alamasri Industri Tbk	IKAI	1.13 B	0.95 B	0.67 B	
4	Indah Kiat Pulp & Paper Tbk	INKP	0.83 B	0.38 B	0.62 B	
5	Itamaraya Tbk	ITMA	-2.01 B	-1.71 B	-5.37 B	
6	Kertas Basuki Rachmat Ind. Tbk	KBRI	-1.80 B	-1.95 B	-1.53 B	
7	Muliaglass	MLSS	-1.29 B	-2.39 B	-1.22 B	
8	Pakuwon Jati Tbk	PWON	0.38 B	0.74 B	1.14 B	
9	Prasidha Aneka Niaga Tbk	PSDN	-0.13 B	0.20 B	0.69 B	
10	Surabaya Agung Industry Pulp Tbk	SAIP	-1.54 B	-0.99 B	-1.22 B	
11	Sumalindo Lestari Jaya Tbk	SULI	-0.24 B	-1.30 B	-0.75 B	
12	Ultra Jaya Milk Tbk	ULTJ	3.39 N	2.89 N	2.84 N	
Total Prediction			11	11	11	33
Non-Bankrupt companies			Prediction			
1	Astra International Tbk	ASII	2.95 N	3.00 N	2.97 N	
2	Bakrie & Brothers Tbk	BNBR	-2.63 B	-0.89 B	-1.02 B	
3	Barito Pacific Tbk	BRPT	2.03 N	1.25 B	1.04 B	
4	Berlian Laju Tanker Tbk	BLTA	0.85 B	0.18 B	0.33 B	
5	Gudang Garam Tbk	GGRM	4.01 N	4.42 N	4.64 N	
6	Holcim Indonesia Tbk	SMCB	0.23 B	1.14 B	2.24 N	
7	Indocement Tunggal Prakarsa Tbk	INTP	4.01 N	5.15 N	6.33 N	
8	Indofood Sukses Makmur Tbk	INDF	1.50 B	1.82 N	2.12 N	
9	Kalbe Farma Tbk	KLBF	5.18 N	5.23 N	6.61 N	
10	Semen Gresik Tbk	SMGR	5.64 N	6.02 N	5.27 N	
11	Unilever Indonesia	UNVR	5.32 N	5.56 N	5.07 N	
12	United Tractor	UNTR	2.99 N	3.46 N	3.28 N	
Total prediction			8	8	9	25
Actual			24	24	24	72
Predicted			19	19	20	58
Accuracy			79%	79%	83%	81%

	Bankrupt condition (B)	(Z<1.81)
	Non-Bankrupt condition (N)	(Z>1.81)
	Predicted	
	Actual (2011)	

This table shows the result of prediction for Altman Revised Model in 2008-2010:

Table 4.2 Z-Score Result of Altman Revised Model

NO	Company Name	code	A revised z score			
			2008	2009	2010	Total
Bankrupt companies			Prediction			
1	Akasha Wira International Tbk	ADES	-1.86 B	-1.73 B	-1.15 B	
2	Dynaplast Tbk	DYNA	0.37 B	0.73 B	1.38 N	
3	Intikeramik Alamasri Industri Tbk	IKAI	0.84 B	0.65 B	0.47 B	
4	Indah Kiat Pulp & Paper Tbk	INKP	0.70 B	0.31 B	0.54 B	
5	Itamaraya Tbk	ITMA	-1.11 B	-0.64 B	-3.53 B	
6	Kertas Basuki Rachmat Ind. Tbk	KBRI	-1.01 B	-1.08 B	-0.75 B	
7	Muliaglass	MLSS	-0.52 B	-1.36 B	-0.52 B	
8	Pakuwon Jati Tbk	PWON	0.31 B	0.62 B	0.95 B	
9	Prasidha Aneka Niaga Tbk	PSDN	0.76 B	0.83 B	1.25 N	
10	Surabaya Agung Industry Pulp Tbk	SAIP	-0.88 B	-0.40 B	-0.65 B	
11	Sumalindo Lestari Jaya Tbk	SULI	0.01 B	-0.77 B	-0.34 B	
12	Ultra Jaya Milk Tbk	ULTJ	2.65 N	2.18 N	2.19 N	
Total Prediction			11	11	9	31
Non-Bankrupt companies			Prediction			
1	Astra International Tbk	ASII	2.50 N	2.50 N	2.49 N	
2	Bakrie & Brothers Tbk	BNBR	-0.48 B	-0.48 B	-0.72 B	
3	Barito Pacific Tbk	BRPT	1.20 N	1.20 B	1.08 B	
4	Berlian Laju Tanker Tbk	BLTA	0.10 B	0.10 B	0.24 B	
5	Gudang Garam Tbk	GGRM	3.45 N	3.45 N	3.60 N	
6	Holcim Indonesia Tbk	SMCB	1.25 B	1.25 N	1.80 N	
7	Indocement Tunggal Prakarsa Tbk	INTP	3.97 N	3.97 N	4.74 N	
8	Indofood Sukses Makmur Tbk	INDF	1.60 N	1.60 N	1.76 N	
9	Kalbe Farma Tbk	KLBF	4.09 N	4.09 N	5.07 N	
10	Semen Gresik Tbk	SMGR	4.69 N	4.69 N	4.08 N	
11	Unilever Indonesia	UNVR	4.98 N	4.98 N	4.57 N	
12	United Tractor	UNTR	2.88 N	2.88 N	2.72 N	
Total prediction			9	9	9	27
Actual			24	24	24	72
Predicted			20	20	18	58
Accuracy			83%	83%	75%	81%

	Bankrupt condition (B)	(Z<1.23)
	Non-Bankrupt condition (N)	(Z>1.23)
	Predicted	
	Actual (2011)	

This table shows the result of prediction for Altman New Model in 2008-2010:

Table 4.3 Z-Score Result of Altman New Model

NO	Company Name	code	A new z score				Total		
			2008	2009	2010				
Bankrupt companies			Prediction						
1	Akasha Wira International Tbk	ADES	10.00	B	-8.45	B	-6.28	B	
2	Dynaplast Tbk	DYNA	0.58	B	1.45	B	0.48	B	
3	Intikramik Alamasri Industri Tbk	IKAI	2.78	B	2.85	B	2.04	B	
4	Indah Kiat Pulp & Paper Tbk	INKP	1.13	B	0.20	B	0.55	B	
5	Itamaraya Tbk	ITMA	-6.89	B	-6.88	B	14.29	B	
6	Kertas Basuki Rachmat Ind. Tbk	KBRI	-5.16	B	-5.51	B	-4.51	B	
7	Muliaglass	MLSS	-7.60	B	10.43	B	-6.98	B	
8	Pakuwon Jati Tbk	PWON	0.41	B	1.01	B	1.65	B	
9	Prasidha Aneka Niaga Tbk	PSDN	-3.51	B	-1.59	B	-1.98	B	
10	Surabaya Agung Industry Pulp Tbk	SAIP	-4.53	B	-2.73	B	-3.17	B	
11	Sumalindo Lestari Jaya Tbk	SULI	-1.92	B	-4.69	B	-3.15	B	
12	Ultra Jaya Milk Tbk	ULTJ	6.62	N	5.21	N	5.19	N	
Total Prediction			9		9		9		27
Non-Bankrupt companies			Prediction						
1	Astra International Tbk	ASII	4.00	N	4.31	N	4.05	N	
2	Bakrie & Brothers Tbk	BNBR	-7.07	B	-2.97	B	-2.27	B	
3	Barito Pacific Tbk	BRPT	2.38	N	1.34	B	0.18	B	
4	Berlian Laju Tanker Tbk	BLTA	0.95	B	-0.32	B	0.18	B	
5	Gudang Garam Tbk	GGRM	7.13	N	8.19	N	8.76	N	
6	Holcim Indonesia Tbk	SMCB	-0.75	B	0.44	B	3.44	N	
7	Indocement Tunggal Prakarsa Tbk	INTP	6.56	N	9.45	N	12.30	N	
8	Indofood Sukses Makmur Tbk	INDF	0.89	B	2.01	N	3.52	N	
9	Kalbe Farma Tbk	KLBF	9.65	N	9.62	N	12.36	N	
10	Semen Gresik Tbk	SMGR	10.75	N	11.47	N	9.79	N	
11	Unilever Indonesia	UNVR	5.99	N	6.39	N	5.37	N	
12	United Tractor	UNTR	4.45	N	5.33	N	4.84	N	
Total prediction			8		9		9		26
Actual			24		24		24		72
Predicted			17		18		18		53
Accuracy			71%		75%		75%		74%

- Bankrupt condition (B) (Z<1.1)
- Non-Bankrupt condition (N) (Z>1.1)
- Predicted
- Actual (2011)

4.4. Prediction Result of First Altman Model

a. Group I (Bankrupt Companies)

Based on research using the First Altman model on the bankrupt group (Group I), 92% sample of manufacturing firms in 2008 is predicted experiencing bankruptcy. It is determined by the Z-score smaller than 1.81. Z-scores for bankrupt companies are in the range of -3.37 to 1.13. And based on the first Altman model obtained 10 manufacturing that always predicted to be bankrupt from year 2008-2010. While manufacturing companies predicted to be non-bankrupt is 8% of the total sample, which is determined by the Z-score greater than 2.99 or not less than 1.81. Z-scores for non-bankrupt companies in 2008 are 3.39.

Table 4.4 Altman Z-Score Results, Sample of Bankrupt Firms

classification result first Z-score	Bankrupt Group			Total
	2008	2009	2010	
N (actual)	12	12	12	36
N predicted	11	11	11	33
percent correct	92%	92%	92%	92%

By comparing number of a company predicted to be bankrupt with the actual condition of the company it will be obtain correct percentage. This percentage shows the accuracy of the prediction. In 2008 the number of bankrupt condition is 11 and the actual is 12 so the accuracy will be 92%. Then the total accuracy from year 2008-2010 will show that the first Altman model is 92% accurate in predicting the financial distress of Group I.

b. Group II (Non-Bankrupt Companies)

Based on research using the First Altman model on the non-bankrupt group (Group II), 67% sample of manufacturing firms in 2008 is not predicted experiencing bankruptcy. It is determined by the Z-score greater than 2.99 or not less than 1.81. Z-scores for non-bankrupt companies are in the range of 2.03 to 5.64. And based on the first Altman model obtained 7 manufacturing that always predicted to be non-bankrupt from year 2008-2010. While manufacturing companies in 2008 predicted to be bankrupt are 33% of the total sample, which is determined by the Z-score smaller than 1.81. Z-scores for bankrupt companies are in the range of -.2.63 to 1.50.

Table 4.5 Altman Z-Score Results, Sample of Non-Bankrupt Firms

classification result	first Z-score	Non-Bankrupt Group			Total
		2008	2009	2010	
N (actual)		12	12	12	36
N predicted		8	8	9	25
percent correct		67%	67%	75%	69%

By comparing number of a company predicted to be non-bankrupt with the actual it will be obtain correct percentage that shows the accuracy of the prediction. In 2008 the number of non-bankrupt condition is 8 and the actual is 12 so the accuracy will be 67%. Then the total accuracy from year 2008-2010 will show that the First Altman model is 69% accurate in predicting the financial distress of Group II.

From the accuracy of First Altman Model for predicting Group I and Group II it can be obtain the overall accuracy of First Altman model:

Bankrupt (actual)	Non Bankrupt (actual)	overall
(36)	(36)	(72)
33	25	58
92%	69%	81%

It can be concluded that Hypothesis I is accepted and Altman first model 81% accurate in predicting financial distress of manufacturing companies.

4.5. Prediction Result of Altman Revised Model

c. Group I (bankrupt companies)

Based on research using the Altman Revised Model on the bankrupt group (Group I), 92% sample of manufacturing firms in 2008 is predicted experiencing bankruptcy. It is determined by the Z'-score smaller than 1.81. Z'-scores for bankrupt companies are in the range of -1.86 to 0.84. And based on the Altman Revised Model obtained 9 manufacturing that always predicted to be bankrupt from year 2008-2010. While manufacturing companies predicted to be non-bankrupt is 8% of the total sample, which is determined by the Z'-score greater than 2.99 or not less than 1.81. Z'-scores for non-bankrupt companies in 2008 are 2.18.

Table 4.6 Altman Revised Z'-Score Results, Sample of Bankrupt Firms

classification result A revised Z'	Bankrupt Group			Total
	2008	2009	2010	
N (actual)	12	12	12	36
N predicted	11	11	9	31
percent correct	92%	92%	75%	86%

By comparing number of a company predicted to be bankrupt with the actual condition of the company it will be obtain correct percentage. This percentage shows the accuracy of the prediction. In 2008 the number of bankrupt condition is 11 and the actual is 12 so the accuracy will be 92%. Then the total accuracy from year 2008-2010 will show that the Altman Revised Model is 86% accurate in predicting the financial distress of Group I.

d. Group II (non-bankrupt companies)

Based on research using the Altman Revised Model on the non-bankrupt group (Group II), 75% sample of manufacturing firms in 2008 is not predicted experiencing bankruptcy. It is determined by the Z'-score greater than 2.99 or not less than 1.81. Z'-scores for non-bankrupt companies are in the range of 1.25 to 4.98. And based on the Altman Revised Model obtained 9 manufacturing that always predicted to be non-bankrupt from year 2008-2010. While manufacturing companies in 2008 predicted to be bankrupt are 25% of the total sample, which is determined by the Z'-score smaller than 1.81. Z'-scores for bankrupt companies are in the range of -0.48 to 1.20.

Table 4.7 Altman Revised Z'-Score Results, Sample of Non-Bankrupt Firms

classification result A revised Z'	Non-Bankrupt Group			
	2008	2009	2010	Total
N (actual)	12	12	12	36
N predicted	9	9	9	27
percent correct	75%	75%	75%	75%

By comparing number of a company predicted to be non-bankrupt with the actual it will be obtain correct percentage that shows the accuracy of the prediction. In 2008 the number of non-bankrupt condition is 9 and the actual is 12 so the accuracy will be 75%. Then the total accuracy from year 2008-2010 will show that the Altman Revised Model is 75% accurate in predicting the financial distress of Group II.

From the accuracy of Altman Revised Model for predicting Group I and Group II it can be obtain the overall accuracy:

Overall Percentage Accuracy of Altman First Model

Bankrupt (actual)	Non Bankrupt (actual)	overall
(36)	(36)	(72)
31	27	58
86%	75%	81%

It can be concluded that Hypothesis II is accepted and Altman Revised Model 81% accurate in predicting financial distress of manufacturing companies.

4.6. Prediction Result of Altman New Model

e. Group I (bankrupt companies)

Based on research using the Altman New Model on the bankrupt group (Group I), 75% sample of manufacturing firms in 2008 is predicted experiencing bankruptcy. It is determined by the Z"-score smaller than 1.81. Z"-scores for bankrupt companies are in the range of -10.0 to 0.58. And based on the Altman New Model obtained 9 manufacturing that always predicted to be bankrupt from year 2008-2010. While manufacturing companies predicted to be non-bankrupt is 25% of the total sample, which is determined by the Z"-score greater than 2.99 or not less than 1.81. Z"-scores for bankrupt companies in 2008 are 1.13 to 6.62.

Table 4.8 Altman New-Z"-Score Results, Sample of Bankrupt Firms

classification result A New Z"	Bankrupt Group			Total
	2008	2009	2010	
N (actual)	12	12	12	36
N predicted	9	9	9	27
percent correct	75%	75%	75%	75%

By comparing number of a company predicted to be bankrupt with the actual it will be obtain correct percentage that shows the accuracy of the prediction. In 2008 the number of bankrupt condition is 9 and the actual is 12 so the accuracy will be 75%. Then the total accuracy from year 2008-2010 will show that the Altman New Model is 75% accurate in predicting the financial distress of Group I.

f. Group II (non-bankrupt companies)

Based on research using the Altman New Model on the non-bankrupt group (Group II), 67% sample of manufacturing firms in 2008 is not predicted experiencing bankruptcy. It is determined by the Z''-score greater than 2.99 or not less than 1.81. Z''-Scores for non-bankrupt companies are in the range of 2.38 to 10.75. And based on the Altman New Model obtained 7 manufacturing that always predicted to be non-bankrupt from year 2008-2010. While manufacturing companies in 2008 predicted to be bankrupt are 33% of the total sample, which is determined by the Z''-score smaller than 1.81. Z''-scores for bankrupt companies are in the range of -.7.07 to 0.95.

Table 4.9 Altman New Z''-Score Results, Sample of Non-Bankrupt Firms

classification result A New Z''	Non-Bankrupt Group			
	2008	2009	2010	Total
N (actual)	12	12	12	36
N predicted	8	9	9	26
percent correct	67%	75%	75%	72%

By comparing number of a company predicted to be non-bankrupt with the actual it will be obtain correct percentage that shows the accuracy of the prediction. In 2008 the number of non-bankrupt condition is 8 and the actual is 12 so the accuracy will be 67%. Then the total accuracy from year 2008-2010 will show that the Altman New Model is 72% accurate in predicting the financial distress of Group II.

From the accuracy of Altman New Model for predicting Group I and Group II it can be obtain the overall accuracy:

Overall Percentage Accuracy of Altman First Model

Bankrupt (actual)	Non Bankrupt (actual)	overall
(36)	(36)	(72)
31	27	58
75%	72%	74%

It can be concluded that Hypothesis III is accepted and Altman New model 74% accurate in predicting financial distress of manufacturing companies.

4.7. Comparison of Three Altman Bankruptcy Prediction Models

After doing the calculations of each model and Altman's bankruptcy prediction results have been obtained, then it is compared between the results of Altman's model in order to see the differences and accuracy of each model in predicting bankruptcy.

Here is a comparison of bankruptcy prediction results from the first Altman Model, Altman Revised Model and Altman New Model.

Table 4.10 Accuracy Comparison of Three Altman Model

Overall Percentage Accuracy

sample	Bankrupt	Non Bankrupt	overall
First (Z)	89%	69%	81%
revised (Z')	86%	75%	81%
new (Z'')	75%	72%	74%

From the comparison between the First Altman Model, Altman Revised Model and Altman New Model it can be seen that First Altman Model, Altman Revised Model to predict bankruptcy is not much different which has the same value of 81%. Altman new Model has the lowest accuracy of any other prediction models. It can be caused by the ratio of X5 (sales to total asset) that removed from previous model. In conclusion, the prediction of bankruptcy by Altman shows that First Altman Model and Altman Revised Model are more accurate in predicting financial distress of the manufacturing companies.

Based on the explanation of the above, investors, creditors, auditors, government, and business owners can obtain a picture the probability the company to be bankrupt or not based on consideration of all three models, first Altman Model, Altman Revised Model and Altman New Model. Corporate bankruptcy prediction can help decision makers to determine decisions toward companies experiencing financial difficulties.

CHAPTER V

CONCLUSION

5.1 Research Conclusion

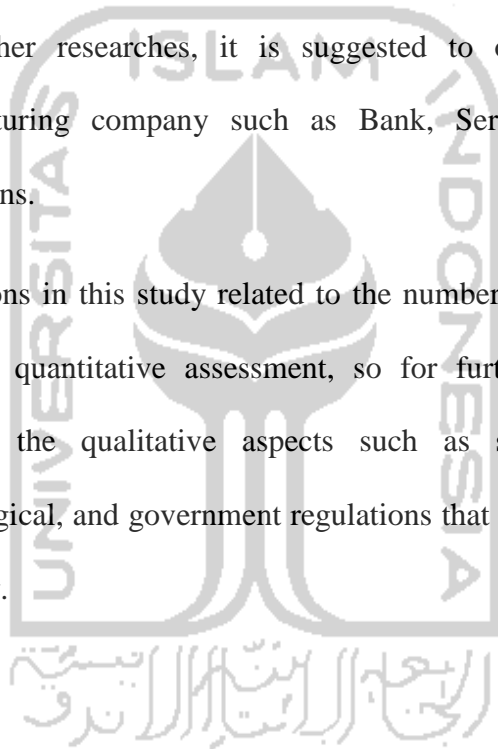
Based on the discussion and analysis on the previous chapter, the research that aims to analyze financial ratios to predict financial distress of manufacturing companies which results:

1. Bankruptcy prediction models used in this study is First Altman Model, Altman Revised Model, and Altman New Model. From the data analysis, it was found all of three Altman Z-score Models are accurate in predicting financial distress of manufacturing companies which have accuracy of 81%, 81%, and 74%.
2. From three models, First Altman Model and Altman Revised Model to predict bankruptcy are not much different which has accuracy value of 81%.
3. First Altman Model and Altman Revised Model are the models that have higher accuracy in predicting financial distress of manufacturing companies. And Altman new Model has the lowest accuracy of any other prediction models.

5.2 Research Recommendations

After completing this research, the following recommendations are suggested:

1. For further researches, it is suggested to observe other prediction models to be used as the comparison in predicting the bankruptcy.
2. For further researches, it is suggested to observe samples of non-manufacturing company such as Bank, Service Company, Financial Institutions.
3. Limitations in this study related to the number of variables that are used only for quantitative assessment, so for further research, it can also consider the qualitative aspects such as social, customer believe, technological, and government regulations that caused the bankruptcy of a company.



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Appendices

Summary of Financial statements

in billion rupiah	PT Astra International Tbk			in million rupiah	PT Akasha Wira International Tbk		
	2008	2009	2010		2008	2009	2010
current asset	35531	36742	46843	current asset	60226	58150	78014
current liabilities	26883	26760	37124	current liabilities	100289	26902	20111
working capital	8648	9982	9719	working capital	-40063	31248	57903
retained earning	28602	35161	44306	retained earning	-521293	-540024	-518241
ebit	15363	16402	21031	ebit	-9304	4115	9577
bve	33080	39894	49310	bve	74744	56013	77796
total liabilities	40163	40006	54168	total liabilities	114776	114408	97194
sales	97064	98526	129991	sales	96632	93919	108122
total asset	80740	88938	112857	total asset	189520	170421	174990
Z	2.95	3.00	2.97	Z	-3.37	-3.29	-2.47
Z'	2.50	2.50	2.49	Z'	-1.86	-1.73	-1.15
Z''	4.00	4.31	4.05	Z''	-10.00	-8.45	-6.28

in billion rupiah	PT Bakrie & Brothers Tbk			in million rupiah	PT DYNAPLAST Tbk		
	2008	2009	2010		2008	2009	2010
current asset	5220	5304	14875	current asset	430623	451367	509722
current liabilities	9514	6708	6346	current liabilities	526760	519132	678996
working capital	-4294	-1404	8529	working capital	-96137	-67765	-169274
retained earning	-17760	-20105	-27746	retained earning	203949	253801	287679
ebit	-15598	-1444	-8506	ebit	8302	116812	129354
bve	7483	4014	10692	bve	401249	439404	50644
total liabilities	17934	18212	18120	total liabilities	833755	851186	1501641
sales	8404	7631	13109	sales	83565	139283	1613688
total asset	25417	26388	31768	total asset	1235004	1290590	1552285
Z	-2.63	-0.89	-1.02	Z	0.52	0.93	1.46
Z'	-2.12	-0.48	-0.72	Z'	0.37	0.73	1.38
Z''	-7.07	-2.97	-2.27	Z''	0.58	1.45	0.48

in billion rupiah	PT Barito Pacific Tbk			in million rupiah	PT Intikeramik Alamasri Industri Tbk		
	2008	2009	2010		2008	2009	2010
current asset	5129	6093	5915	current asset	288843	325738	305383
current liabilities	2324	2841	4104	current liabilities	80646	73426	76613
working capital	2805	3252	1811	working capital	208197	252312	228770
retained earning	-6034	-5487	-6028	retained earning	21309	31537	-60715
ebit	4520	1146	131	ebit	11427	-16806	-34710
bve	6824	6454	5859	bve	348739	327461	266714
total liabilities	10419	10116	10156	total liabilities	432429	456314	471409
sales	18322	14393	16965	sales	189094	118006	171252
total asset	17243	16570	16015	total asset	781168	783775	738123
Z	2.03	1.25	1.04	Z	1.13	0.95	0.67
Z'	1.96	1.20	1.08	Z'	0.84	0.65	0.47
Z''	2.38	1.34	0.18	Z''	2.78	2.85	2.04

in billion rupiah	PT Berlian Laju Tanker Tbk		
	2008	2009	2010
current asset	3541	3375	3832
current liabilities	4958	4449	3712
working capital	-1417	-1074	120
retained earning	4421	2916	1582
ebit	1567	-2849	-1532
bve	5897	6182	6841
total liabilities	19079	18797	21514
sales	7005	6183	6568
total asset	24976	24979	28355
Z	0.85	0.18	0.33
Z'	0.71	0.10	0.24
Z''	0.95	-0.32	0.18

in million dollar	PT INDAH KIAT PULP & PAPER Tbk		
	2008	2009	2010
current asset	1046	823	1101
current liabilities	817	870	1088
working capital	229	-47	13
retained earning	-8	-212	-153
ebit	257	-152	66
bve	2186	1982	2041
total liabilities	3853	3783	3905
sales	1870	1238	1828
total asset	6040	5766	5947
Z	0.83	0.38	0.62
Z'	0.70	0.31	0.54
Z''	1.13	0.20	0.55

in billion rupiah	PT Gudang Garam Tbk		
	2008	2009	2010
current asset	17008	19584	22908
current liabilities	7670	7961	8481
working capital	9338	11623	14427
retained earning	14303	17085	19981
ebit	2656	4828	5631
bve	15519	18301	21197
total liabilities	8553	8929	9544
sales	30251	32973	37691
total asset	24072	27230	30741
Z	4.01	4.42	4.64
Z'	3.13	3.45	3.60
Z''	7.13	8.19	8.76

in million rupiah	PT. ITAMARAYA GOLD INDUSTRI Tbk		
	2008	2009	2010
current asset	1012	976	1021
current liabilities	7162	4205	7265
working capital	-6150	-3229	-6244
retained earning	-34276	-32111	-36551
ebit	-2167	935	-3585
bve	6523	8688	4248
total liabilities	16263	5105	8165
sales	11246	8016	0
total asset	22786	13793	12413
Z	-2.01	-1.71	-5.37
Z'	-1.11	-0.64	-3.53
Z''	-6.89	-6.88	-14.29

in billion rupiah	PT Holcim Indonesia Tbk		
	2008	2009	2010
current asset	1924	1476	2253
current liabilities	1143	1162	1355
working capital	781	314	898
retained earning	-5184	-4288	505
ebit	303	1296	1147
bve	2537	3314	6822
total liabilities	5173	3949	3611
sales	4803	5943	5960
total asset	7674	7265	10437
Z	0.23	1.14	2.24
Z'	0.45	1.25	1.80
Z''	-0.75	0.44	3.44

in million rupiah	PT KERTAS BASUKI RACHMAT INDONESIA Tbk		
	2008	2009	2010
current asset	24005	14195	8020
current liabilities	131028	167653	95272
working capital	-107023	-153458	-87252
retained earning	-1911474	-1967501	-1894104
ebit	-18656	22897	74171
bve	570756	526560	599970
total liabilities	562134	603510	465993
sales	132258	69160	58528
total asset	1132890	1130070	1065963
Z	-1.80	-1.95	-1.53
Z'	-1.01	-1.08	-0.75
Z''	-5.16	-5.51	-4.51

in billion rupiah	PT Indocement Tunggal Prakarsa Tbk		
	2008	2009	2010
current asset	3471	5341	7484
current liabilities	1943	1779	1347
working capital	1528	3562	6137
retained earning	3751	5920	8292
ebit	2332	3796	4248
bve	8500	10680	13077
total liabilities	2786	2596	2269
sales	9780	10576	11137
total asset	11286	13276	15346
Z	4.01	5.15	6.33
Z'	3.16	3.97	4.74
Z''	6.56	9.45	12.30

in billion rupiah	PT Muliaglass		
	2008	2009	2010
current asset	1246	1341	1159
current liabilities	3648	4295	3362
working capital	-2402	-2954	-2203
retained earning	-1530	-2149	-1313
ebit	142	-187	130
bve	-1012	-1631	-795
total liabilities	3719	4384	3445
sales	1499	1212	1185
total asset	2707	2753	2650
Z	-1.29	-2.39	-1.22
Z'	-0.52	-1.36	-0.52
Z''	-7.60	-10.43	-6.98

in billion rupiah	PT Indofood Sukses Makmur Tbk		
	2008	2009	2010
current asset	14598	12967	20077
current liabilities	16262	11148	9859
working capital	-1664	1819	10218
retained earning	5268	6926	9040
ebit	2599	4063	5432
bve	8498	10155	16784
total liabilities	31096	22423	24886
sales	38799	37397	38403
total asset	39594	40382	47275
Z	1.50	1.82	2.12
Z'	1.37	1.60	1.76
Z''	0.89	2.01	3.52

in million rupiah	PT. PAKUWON JATI Tbk.		
	2008	2009	2010
current asset	372466	329936	524376
current liabilities	410547	348467	501458
working capital	-38081	-18531	22918
retained earning	599	147222	425732
ebit	33722	203105	385552
bve	1003924	1150547	1429057
total liabilities	2558577	2326322	2508268
sales	453811	697388	1228007
total asset	3562501	3476869	3937325
Z	0.38	0.74	1.14
Z'	0.31	0.62	0.95
Z''	0.41	1.01	1.65

in billion rupiah	PT Kalbe Farma Tbk		
	2008	2009	2010
current asset	4168	4701	5037
current liabilities	1250	1574	1146
working capital	2918	3127	3891
retained earning	3684	4489	5531
ebit	1178	1471	1770
bve	3622	4310	5373
total liabilities	1358	1691	1260
sales	7877	9087	10226
total asset	5703	6482	7032
Z	5.18	5.23	6.61
Z'	4.04	4.09	5.07
Z''	9.65	9.62	12.36

in million rupiah	PT. PRASIDHA ANEKA NIAGA Tbk.		
	2008	2009	2010
current asset	182365	179406	228024
current liabilities	83628	68425	138413
working capital	98737	110981	89611
retained earning	-684207	-590704	-578540
ebit	39709	57078	36541
bve	97550	128865	141209
total liabilities	188246	151292	185929
sales	566690	402437	672397
total asset	324275	327624	379075
Z	-0.13	0.20	0.69
Z'	0.76	0.83	1.25
Z''	-3.51	-1.59	-1.98

in billion rupiah	PT Semen Gresik Tbk		
	2008	2009	2010
current asset	7083	8219	7343
current liabilities	2092	2294	2517
working capital	4991	5925	4826
retained earning	6169	7889	9701
ebit	3589	4655	4722
bve	8069	10197	12006
total liabilities	2429	2633	3423
sales	12209	14387	14344
total asset	10602	12951	15562
Z	5.64	6.02	5.27
Z'	4.42	4.69	4.08
Z''	10.75	11.47	9.79

in million rupiah	PT. SURABAYA AGUNG INDUSTRI PULP & KERTAS Tbk.		
	2008	2009	2010
current asset	233227	185539	255805
current liabilities	610148	223580	297554
working capital	-376921	-38041	-41749
retained earning	-2506914	-2434044	-2283618
ebit	-48078	342301	114377
bve	-768506	-893184	-742758
total liabilities	3327491	3294978	3124498
sales	537699	333234	298772
total asset	2558985	2401794	2381740
Z	-1.54	-0.99	-1.22
Z'	-0.88	-0.40	-0.65
Z''	-4.53	-2.73	-3.17

in billion rupiah	PT Unilever Indonesia Tbk		
	2008	2009	2010
current asset	3103	3601	3748
current liabilities	3091	3589	4402
working capital	12	12	-654
retained earning	2912	3515	3857
ebit	3448	4248	4538
bve	3100	3702	4045
total liabilities	3397	3776	4652
sales	15577	18246	19960
total asset	6504	7484	8701
Z	5.32	5.56	5.07
Z'	4.78	4.98	4.57
Z''	5.99	6.39	5.37

in million rupiah	PT SUMALINDO LESTARI JAYA Tbk		
	2008	2009	2010
current asset	489634	332644	435696
current liabilities	701819	963720	841649
working capital	-212185	-631076	-405953
retained earning	-1044258	-1350711	-1292962
ebit	-41747	-140169	9736
bve	588381	179310	360661
total liabilities	1611834	1744473	1595563
sales	855298	428779	489085
total asset	2200215	1974902	2009911
Z	-0.24	-1.30	-0.75
Z'	0.01	-0.77	-0.34
Z''	-1.92	-4.69	-3.15

in billion rupiah	PT United Tractor Tbk		
	2008	2009	2010
current asset	12883	11989	15532
current liabilities	7874	7258	9919
working capital	5009	4731	5613
retained earning	6100	8729	10972
ebit	3851	5444	5061
bve	11131	13843	16136
total liabilities	11644	10453	13535
sales	27903	29241	37323
total asset	22847	24404	29700
Z	2.99	3.46	3.28
Z'	2.52	2.88	2.72
Z''	4.45	5.33	4.84

in million rupiah	PT ULTRAJAYA MILK INDUSTRY & TRADING COMPANY Tbk		
	2008	2009	2010
current asset	877656	765318	926154
current liabilities	385685	351285	430608
working capital	491971	414033	495546
retained earning	515359	537233	640947
ebit	399713	70195	165385
bve	1184945	1177940	1287754
total liabilities	552199	531966	696811
sales	1017111	1180938	1404945
total asset	1737144	1709906	1984565
Z	3.39	2.89	2.84
Z'	2.65	2.18	2.19
Z''	6.62	5.21	5.19