UNIVERSITI PUTRA MALAYSIA

PREDICTING CORPORATE FAILURE USING ACCOUNTING INFORMATION: THE MALAYSIAN EXPERIENCE

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By

ZULKARNAIN BIN MUHAMAD SORI

Thesis Submitted in Fulfilment of the Requirements for the degree of Master of Science in the Faculty of Economics and Management Universiti Putra Malaysia

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DEDICATION

This work is dedicated to three people who have been most important in my life They are my mother, Haminah Amat, my late father, Allahyarham Muhamad Sori, and my wife, Siti Shaharatulfazzah. This degree would not have become reality for me without caring, co-operation, understanding, support, motivation and love from my wife. She is my friend, my lover and motivator.

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirements for the degree of Master of Science

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Chairman : **Mohamad Ali Abd Hamid, Ph. D.**

Faculty : **Economics and Management**

Financial ratios have long been used as predictor of important events in the financial markets. Researchers have formulated business failure prediction models utilising financial ratios. However, relatively few failure prediction studies on Malaysian firms have been documented. The objective of this study is to develop a model that can discriminate between Malaysian failed and non-failed firm. Also, this study investigates the distributional properties of the financial ratios of failed and non-failed listed firms. One-to-one sampling technique was utilised, where 33 failed and non-failed mixed industry sector firms, and 24 failed and non-failed industrial sector firms for the period from 1980 to 1996 were sampled. Using Kolgomorov-Smirnov test adjusted to Lillifors test, it was found that, only one financial ratio was normally distributed. Nine financial ratios were found to be lognormal in mixed industry

sector and the number ıncreased to 18 ın the industrıal sector In additıon, 3 financıal ratios were square root normal in mixed industry sector and 6 in industrial sector It is found that the log transformation technique was the most effective procedure and the square transformation technique was the least effective to transform non-normally distribution data to the family of lognormal distribution Finally, industry sector played an ımportant role in determining the normality level, where focused into specific industry sector gave better results than mixed industry sector However, it is found that the equality of variance covariance of the failed and non-failed firms was not observed However, the impact of this inconsistency was minimal on the classification accuracy

After the assumptions of discriminant analysis were satisfied, stepwise multiple discriminant analysis was utilised to develop failure prediction models The mixed industry model correctly classified 86 2% and 91% of the original sample and holdout sample respectively The model was further validated using leave-one-out classification or U-method (86 2% correct classification) The results remain robust and the failed and non-failed classification accuracy was found to be significantly better than chance An alternative prediction model was developed based on accounting information, which outperformed the original model and correctly classified 88 1% of the original sample and 86 7% in U method The models for industrial sector were equally accurate for the mixed industry, which correctly classified more than 80% of the failed and non-failed

firms and the original model outperformed the alternative model. The selected variables in the final model were a good proxy for the profit, cash flow, working capital and net worth variables.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

MERAMAL KEGAGALAN KORPORAT MENGGUNAKAN MAKLUMAT PERAKAUNAN: PENGALAMAN MALAYSIA

Oleh

ZULKARNAIN BIN MUHAMAD SORI

Jun 2000

Pengerusi : Dr Mohamad Ali Abd Hamid

Fakulti : Ekonomi dan Pengurusan

Nisbah kewangan telah lama digunakan sebagai alat ramalan peristiwa penting dalam pasaran kewangan. Penyelidik-penyelidik telah merekabentuk model ramalan kegagalan korporat menggunakan nisbah kewangan. Walaubagaimanapun, penyelidikan ramalan kegagalan bagi firma-firma Malaysia sangat sedikit telah didokumenkan. Objektif kajian ini ialah membentuk model yang membezakan firma Malaysia yang gagal dan tidak gagal. Juga, kajian ini mengkaji sifat taburan nisbah kewangan firma gagal dan tidak gagal. Teknik pensampelan satu kepada satu digunakan, di mana 33 firma industri bercampur yang gagal dan tidak gagal, dan 24 firma bagi sektor industri yang gagal dan tidak gagal yang disenaraikan bagi tempoh dari 1980 ke 1996 digunakan. Dengan menggunakan ujian Kolgomorov Smirnov dilaraskan kepada ujian Lillifor, didapati hanya satu nisbah kewangan menurut taburan

normal. Sembilan nisbah kewangan didapati normal secara log bagi sektor industri bercampur dan bilangannya meningkat kepada 18 bagi sektor industri. Tiga nisbah kewangan ditemui normal secara punca kuasa dua bagi sektor industri bercampur dan 6 bagi sektor industri. Didapati, teknik penukaran secara log adalah prosidur paling efektif dan penukaran kuasa dua adalah prosidur paling tidak efektif bagi menukar taburan data yang tidak normal kepada keluarga taburan normal. Akhirnya, sektor sesuatu industri memainkan peranan penting dalam menentukan tahap normal, di mana fokus kepada sektor industri yang spesifik akan memberikan keputusan yang lebih baik dari sektor industri bercampur. Walau bagaimanapun, ditemui bahawa kesaksamaan varian-covarian data sampel tidak didapati, tetapi kesan ketidaksakmaan varian-kovarian ini adalah minima.

Selepas andaian analisa discriminant dipenuhi, analisa 'stepwise multiple discriminant' telah digunakan bagi membentuk model ramalan kegagalan. Model bagi industri bercampur mengklasifikasikan dengan betul 86.2% sampel asal dan 91% sample diasingkan. Model ini seterusnya disahkan menggunakan kaedah U (86.2% betul klasifikasi). Keputusan kekal tepat dan ketepatan klasifikasi bagi gagal dan tidak gagal ditemui lebih baik dari peluang. Model ramalan alternatif dibentuk berasaskan hanya maklumat perakaunan, mengatasi model asal dan mengklasifikasi dengan tepat 88.1% sampel asal dan 86.7% kaedah U. Model bagi sektor industri adalah sama tepat seperti model industri bercampur, di mana mengklasifikasi dengan betul lebih dari 80% firma gagal dan tidak gagal dan model asal mengatasi model alternatif. Pembolehubah yang terpilih di dalam model akhir adalah wakil terbaik bagi pembolehubah untung, aliran tunai, modal kerja dan nilai bersih.

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Dr Mohamad Ali has been very helpful and has allowed me to utilise the facilities that are available in his office at any time. Dr Annuar, Dr Shamsher and Dr Zainal have been able to resolve many complex problems that arise in many parts of the research process. Without all the committee members, this research would not have become a reality and come to a speedy end.

I am grateful to a friend, Mohd Rosnizam Mohd Deris for his assistance in data collection phase. Finally, I would like to take this opportunity to thank the Universiti Putra Malaysia that provides scholarship and research grant for this purpose.

I certify that an Examination Committee met on 30 June 2000 to conduct the final examination of Zulkarnain Bin Muhamad Sori on his Master of Science thesis entitled "Predicting Corporate Failure Using Accounting Information The Malaysian Experience" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows

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Date: 13 JUL 2000

DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

ZULKARNAIN BIN MUHAMAD SORI

Date: 10.07.2000

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

In today's competitive business environment, corporate failure is a common occurrence among Malaysian corporations of all sizes and sectors. Corporate failure is generally defined when a firm seeks protection under section 176 of the Companies Act 1965. No business entities are immune to failure, which usually defaults in their outstanding indebtedness. The financial turbulence in late 1980s and 1990s highlighted the importance of developing an early warning system to mitigate the incidence of corporate failure among Malaysian business firms. Altman et al. (1979) mentioned that the corporate failure problems are not the sole province of developed countries and can be a relatively more serious problem in the less developed economic environments.

Incidence of corporate failures first received exposure during end of 1960s, followed by more corporate failures during the recession years of 1980 to 1982, and unprecedented amount of attention during the explosion of defaults and large firms bankruptcies in the period 1989 to 1992. However, these exposures were in the developed countries and there is a lack of documented literature on this issues in the less developed countries. The government authorities try to review the problems without a proper research guideline to understand the reasons and consequences of this hectic situation. Most of the decisions made are believed based on trial and error basis.

Firms can experience financial difficulties at various levels. At one extreme, a firm's financial difficulties may lead to bankruptcy and results either in the liquidation of its assets or in reorganisation. In a less extreme come through, still quite serious, are various financial arrangements outside the jurisdiction of the courts that permit continuity of the firm's operations and the satisfaction of the claims of creditors.

Table 1: Statistics of Malaysian Companies Incorporated and Winding Up

Year	Total Incorporation	Liquidation	%*
1990	18,612	NA	NA
1991	21,102	NA	NA
1992	23,285	419	1.8
1993	30,988	392	1.3
1994	43,571	861	2.0
1995	43,238	487	1.1
1996	43,237	681	1.6
1997	40,720	5,615	13.8
1998	18,825	6,409	34.0

Note: NA: Not Available
*Percentage of liquidated over total incorporation of firms.
Source: Registrar of Companies

The number of firms winding up increased since the last 10 years. According to the Registrar of Companies, the phenomenon is normal and not solely attributed to the economic downturn. Also, the crisis is not the real cause of the situation because the problem might arise in the past and it takes a long process to wind up a company. Most companies included in table 1 are small companies that not listed on the KLSE. Usually, the big firms will apply to the court or relevant authorities for restructuring or reorganisation scheme.

According to the Securities Commission, thirty-three listed firms applied to restructure their organisations in the first half of 1999 with unimaginable amount of debts that an average of RM540 million debts per company (totaling to approximately RM18 billions). The total amounts of debts involved are extremely high and this indicates that the failure problem among Malaysian corporate is a serious and requires an immediate attention by the policy makers and relevant authorities.

These highly leveraged corporations suffered financial problem and had to resort to liquidation. They have to formulate survival options including proposal on strategies for corporate rescues and reconstruction. One option which has increasingly been served as a lifeline to Malaysian companies is a restructuring process based on a scheme of arrangement pursuant to section 176 of the Malaysian Companies Act 1965. This process is costly which involves various parties like consultant and lawyer. Even though it is considered as a big business to the legal practitioner, consultant and accounting professional which experienced busiest time than ever with a lot of profitable business restructuring on complex scheme of arrangement, this problem becomes enigma to the government and nations.

Corporate failure is not a sudden event and it develops steadily over many years. Some of the symptoms of firms that well eventually failed are decline in profits, working capital, liquidity and asset quality. In Malaysia, not much documented literature on this issue is available. Business failure in Malaysia should be seriously researched due to the size of economy that can jeopardise business health at the time economic crisis and this will results a great loss to the investors and creditors. This study hopes to provide some important input to policy makers and financial institutions. The ability to spot financial deterioration at an early stage is important because it contributes to both business and financial environment stability.

1.2 Definition of Corporate Distress

Numerous definitions of corporate distress are explained in the literature. The four common terms used in literature are failure, insolvency, default and bankruptcy. It is important to note that there are fine differences in these terms, though they are used interchangeably in practice.

Economically, failure means that the realised rate of return on invested capital is significantly lower than prevailing rates on similar investment. This implies insufficient revenues to cover costs or the average return on investment being below the firm's cost of capital. In the absence of legally enforceable debt, a firm that economically failed sometimes did not failed to meet its current obligation.

Insolvency is a term to show that the firm's total liabilities exceed a fair valuation of its total assets. Conclusively, it means the real net worth of the firm is negative. Another term associated to distress is defaults. Defaults could be in technical or legal form, and involved relationship between the firms and it's creditors. When debtors firm contravenes a condition of an agreement with a creditor is said technical defaults, and can be ground for legal action.

Finally, the bankruptcy term refers to the net worth of the firm and involved formal declaration by the court, accompanied by a petition either to liquidate its asset or attempt a recovery programme.

1.2.1 Business Failure

The harbingers of business failures are usually visible but unfortunately not taken seriously enough, especially in good economic times, until it is too late for any effective recovery measures to materialise. Among the visible signs are arrears interest and loan repayment, delay in payment to suppliers, the staffs and all other creditors, and implementation of some form of austerity measures. The business failure problem can be financial and/or operational in nature Carmichael (1972) described the business failure problem as follows

A. *Financial business failures involves:*

a Liquidity deficiency – the company's current liabilities exceed its current assets, which result in difficulty in meeting current obligations

b Equity deficiency – the company's solvency is questionable because of a retained earnings deficit or, in more extreme cases, an excess of total liabilities over total assets (negative net growth).

c. Debt default – the company has been unable to meet debt payment schedules or has violated one or more other conditions of its loan agreements

d. Funds shortage – the company has either limited or no ability to obtain additional funds from various capital sources

B. *Operational business failures involves:*

a Continued operating losses – no net profit has been earned for more than one past period

b Prospective revenue doubtful – revenue is insufficient for day-to-day operating needs, or there have been cutbacks in operations, such as personnel reductions

c. Ability to operate is jeopardised – legal proceedings related to operations may severely curtail operations, or suppliers of operating materials may refuse to transact with the company

d. Poor control over operations – the company management has been unable to control operations, as evidenced by repetitive, uncorrected problems.

1.3 The Use of Ratios For Failure Prediction Models

The investors and creditors need to know the financial health of the firms over time. It is a common practice among stakeholders to refer to the financial statements to assess firm's financial condition. The basic objective of financial statements is to provide useful information for making economic/investment decisions. Financial statements quantify information concerning the financial position of an entity and the results of its operations for a specified period of time. Ratio analysis has been the major tool used in the interpretation and evaluation of financial statements for investment decision making since the late 1800s (Lev, 1974). The main objective of ratio analysis is to facilitate the interpretation of financial statement, which is achieved through reducing the large number of financial statement items to a relatively small set of ratios. Such ratios relate to the absolute values of financial items to common bases allowing a meaningful comparison of financial data both over time and across firms for a given time period.