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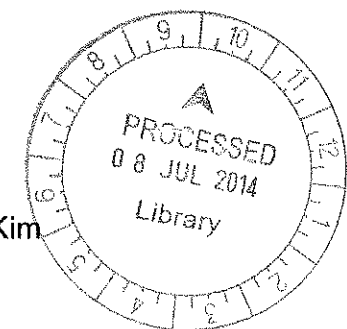
MASTER OF BUSINESS ADMINISTRATION

CORPORATE FINANCIAL DISTRESS PREDICTION IN CHINA
-- A ROBUSTNESS TESTING OF Z_{CHINA}-SCORE MODEL

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DECLARATION

I hereby declare that:

(1) This post-graduate research project is the end result of my own work and that due acknowledgement has been given in references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university or other institutes of learning.

(3) The word account of this research report is 11,320.

Chen Xiao   **22/04/2014**

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Abstract

Prior to 1990s, the application of financial distress prediction for companies in China is rather limited. Later in post 1990s, the popularity of Z-Score Model soared as a movement was initiated among Chinese researchers to adopt and to apply Altman Z-score model towards local Chinese companies. Poor prediction result experienced by the initial movement has prompted the original author of Altman z-score model, Edward I. Altman to team up with two Chinese scholars (Zhang and Yen, 2010) to develop an entirely new financial distress prediction model, known as the Z_{China}-Score Model, specifically for China's companies. This study is to investigate the robustness of Z_{China}-Score Model towards current financial data as well as its robustness towards financial data from different industries. The empirical result of this study concludes that generally the Z_{China}-score Model is a robust model for business stakeholders to refer to when making business decision. However, the prediction accuracy varies in different industries, which business stakeholders should be aware of when using this model. The result also implies that the Z_{China}-score Model should be modified for each homogenous industry to achieve better prediction accuracy.

Keyword: Altman Z-Score Model, Financial distress prediction, robustness testing

CHAPTER 1: INTRODUCTION

1.0 Chapter Overview

This chapter gives a general overview of the research. It aims to give readers a general outline, including research background (Section 1.1), the problem statement (Section 1.2), research questions (Section 1.3) and objectives (Section 1.4), the scope of study (Section 1.5), the significance of study (Section 1.6) and research outline (Section 1.7).

1.1 Background

Financial distress is a common phenomenon in both developing and developed economies (Altman et al, 2000; Ijaz et al., 2013). The ability to predict the possibility of financial distress of a company is important for its stakeholders, especially investors, creditors, shareholders and managers (Xu, 2000; Becchetti & Sierra, 2003). As the economic condition and customer demand have changed dramatically, companies are confronting fierce competition and uncertain business environment. The financial tsunami in 2008 has impaired many countries' economies. Companies which cannot forecast financial distress and take preventive measure at an early stage would run into bankruptcy, which will bring great loss to its stockholder, creditors, managers and other stakeholders. (Anandarajan et al, 2001). Moreover, it also causes significant rippling effects in the society and the whole country's economy (O'Leary, 1998; Ng et al., 2011).

Financial distress does not happen by accident, but acts in a fashion of continuously developing trend (Ijaz et al., 2013). Most companies which ran into financial distress had experienced a process, which usually have some symptoms indicated by the company's account items (Xin and Xiong, 2011). Since the account items in financial statement present the absolute value, in order to expand the explanatory power of the absolute values it is using the method of financial analysis. Financial ratio analysis, which is based on the mutual relationship between selected items and their

value, is the most commonly used financial analysis (Babalola and Abiola, 2013). These ratios more than the absolute values allow the comparison with other business or with industry averages, respectively competitors, and with the other financial years. Also bankruptcy or financial distress models created for the purpose of the comprehensive expression of the financial condition of the company or for the prediction of the further development of the financial situation are based on the ratios (Beaver et al, 2005). Very often and by many users used is the Altman Z-Score Model, which has as its main objective to identify, whether the company will be threatened by financial distress in the next two years (Altman, 1968).

As one of the most well-known financial distress prediction tools, the Altman Z-Score Model was developed by Altman in the USA. Although developed in 1968, the Altman Z-Score Model remains as one of the most widely used models for diagnosing the financial healthiness of companies (Dawley et al., 2002; Moyer, 2005; Boritz, 2007; Hayes et al., 2010; Anjum, 2012). Numerous researches have been conducted to study financial distress prediction and alternative models are also developed. However, the popularity of Altman Z-Score Model remains due to its high practicality and predictive accuracy (Grice and Ingram, 2001; Charitou et al, 2004; Ng et al, 2011; Li, 2012; Jouzbarkand, et al., 2013).

The beauty of Altman Z-Score Model lies in its ability to provide a calculated measure based on past experience, rather than personal opinion (Sulphey and Nisa, 2013). The lower the Z-Score a company has, the greater possibility the company will run into financial distress; the higher the Z-Score the better the company's financial condition is. (Altman, 1968).

Generally, business creditors are the main users of the Z-Score Model. For example, banks commonly used the model to determine the default risk when they are making decision whether to issue a loan. Some business accountants also routinely look at the Z-Score for their business clients. Well-informed investors frequently use Z-Score to check on the financial strength and health of businesses considered for

potential investments. As the Z-Score Model is simple and its required data can be obtained easily, individual investors also use this model frequently. In addition, the turnaround managers use the Z-Score Model in mergers and acquisitions. For them, the model is applied to determine the risks of a merger or acquisitions (Hayes et al., 2010).

Moreover, in fulfilling its purpose to protect human health and the environment, the US Environmental Protection Agency (EPA) also uses Altman's Z-Score Model as a tool to estimate the financial impact caused by regulatory compliance investments in industries such as pharmaceutical, waste treatment, pulp and paper industries, and transportation equipment cleaning and industrial laundries. This is done by comparing pre- and post- compliance Z-Score and evaluate the impact (Browner et al., 2000).

1.2 Problem Statement

Prior to 1990s, the application of financial distress prediction for companies in China is rather limited. This due to the fact that China's first Bankruptcy Law was only in effect on November 1988. Hence, the academic definition of financial distress as well as the required financial data for prediction was virtually non-existent (Altman et al., 2010). Later in post 1990s, the popularity of Z-Score Model soared as a movement was initiated among Chinese researchers to adopt and to apply Altman's Z-Score Model towards local China's companies.

However, many within this movement have concluded that the model produced poor prediction result (Gao, 2006; Zhang and Yang, 2009). That is mainly because of the situations between China and the USA are not similar, particularly in the accounting rules, quality of data, due diligence, equity structure, as well as other factors that affect the performance of a company. Hence the Z-Score Model might not be accurate because it could not reflect accurately the nature of Chinese companies (Altman et al, 2010).

Poor prediction result experienced by the initial movement has prompted the original author of Altman Z-Score Model, Edward I. Altman to team up with two Chinese scholars (Zhang and Yen, 2010) to develop an entirely new financial distress prediction model specifically for China's companies. The new purpose built model, known as the Z_{China}-Score Model, produces prediction accuracy up to 87% (Altman et al., 2010). This is a huge success compared to the prediction result experienced by the initial movement in the 1990s. However, this prediction accuracy should not be taken at face value and its robustness should not go unchallenged. Because, though the Z_{China}-Score Model was formally published in 2010, it was developed using the financially distressed companies in China from the period of 1998 to 1999.

According to Grice and Ingram (2001), the accuracy and structure of the financial distress prediction model changes over time periods. Boritz et al. (2007) shared the same conclusion and further attributed that model performance is highly sensitive to changes in business conditions. Since the Z_{China}-Score Model was developed using data from 1998 to 1999, its robustness and prediction accuracy should not be taken at face value.

As China's economy has been developing rapidly, the business condition is much different between present and last decade. Therefore, it is questionable if the Z_{China}-Score Model can effectively apply in today's marketing condition. Moreover, according to Grice and Ingram (2001)'s study, the Z-Score Model was sensitive to industrial classification. The Z_{China}-Score Model was built on companies from various industries, this also arises the question of the differences in the effectiveness of the model when applying to a specific homogenous industry.

As mentioned previously, accurately predicting a company's financial healthiness is important for its stakeholders. For investors or creditors, a financial catastrophe will occur when they invest or loan to a financial distressed company which is wrongly predicted as non-distressed. On the other hand, it will also result in loss of potential profit associated with the decision of not investing or loaning to the non-distressed

company which was wrongly predicted as distressed company. Hence, testing the robustness of the Z_{China}-Score Model is crucial. This study is to address this research gap, specifically investigating its robustness towards current financial data as well as its prediction accuracy towards financial data from different industries.

To sum up, the motivation to conduct this study can be summarized in figure 1.1.

Figure 1.1 Problem Statement
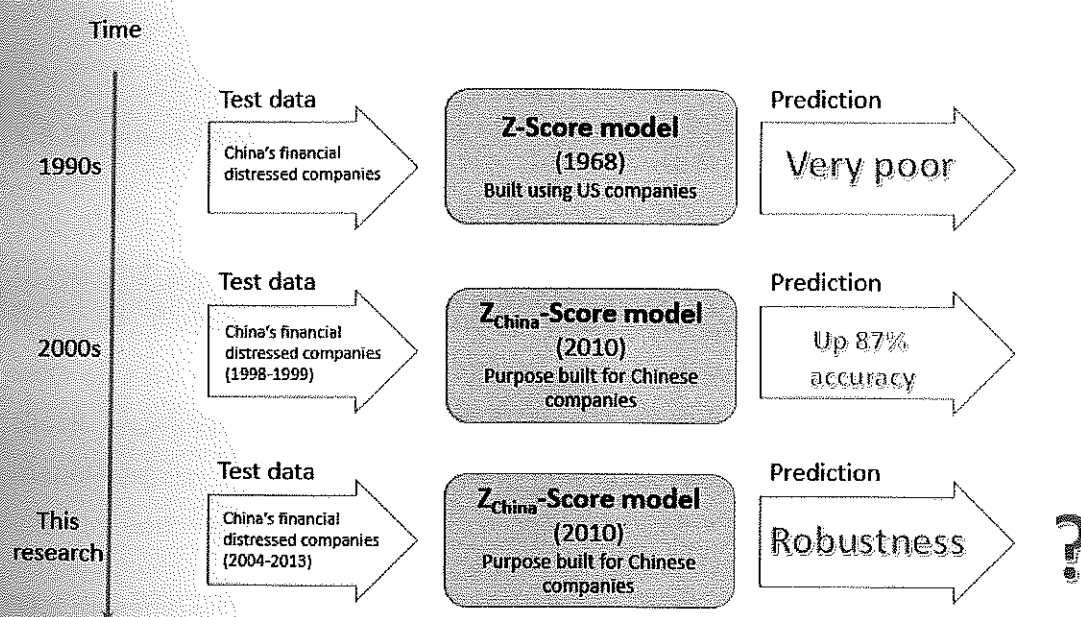
1.3 Research Questions

The wide application of Z_{China}-Score Model and its unknown robustness for financial distress prediction in a specific homogenous industry lead to the following research questions:

1. Whether Altman's Z_{China}-Score Model is as effective for predicting financial distress in China in recent periods as it was for the periods in which it was developed and tested by Altman et al.?