

# AN ANALYSIS OF EFFICACY OF FINANCIAL DISTRESS PREDICTION SPRINGATE AND GROVER MODEL

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## Abstract

The global economy has stagnated as a result of COVID-19. This slowdown is poised to turn into an economic recession, with enterprises experiencing financial difficulties leading to bankruptcy. It is vital to predict such defaults in order to protect the financial market and stakeholders' interests. The aim of this research is to compare the best bankruptcy prediction models from Springate and Grover model by checking the efficacy of these models. For this study, 3 bankrupt NBFC's i.e. DHFL (Dewan Housing Finance Corporation Limited), ILFS Infrastructure Leasing & Financial Services Limited and Srei Infrastructure Finance Ltd are selected for the period of 05 years from 2014-15 to 2018-19. The collected data analyzed by using Microsoft excel software. The present research is useful to the investors, financial institutions and suppliers for investments, loans and supplying raw materials. The result of this study shows that, when compared to the Grover model, the Springate model is more efficient for predicting the financial health of selected companies.

**Keywords:** Financial Health, Bankruptcy Prediction Model, NBFC's, Springate Model and Grover Model

## INTRODUCTION

Insolvency is defined as the inability of a company or individual to pay its debts on time; people who are insolvent are referred to as insolvent. There are two types of insolvency: cash-flow and balance-sheet insolvency. Cash-flow insolvency occurs when a person or company has sufficient assets to pay their debts but lacks the suitable method of payment. A person may, for example, have a huge house and a valuable car but not have liquid assets to pay a debt when it is due. Generally negotiation is the best approach to get out of a cash flow insolvency. Balance sheet insolvency, it occurs when a person or company's assets are insufficient to cover all of their debts.

It is possible that the person or company will file for bankruptcy, although this is not always the case. In today's competitive market, financial distress is a critical factor. Financial health refers to a company's ability to manage its earning resources for expenses and debt repayment. Investors and analysts use financial health as a measure to determine whether or not a company is financially sound. Many banking and financial institutions around the world have failed as a result of the global financial crisis. Despite the fact that the application of financial distress models to predict financial instability has long been a topic of study, the crisis has highlighted the need for more research.

## LITERATURE REVIEW

J. Sun, and X.F. Hui (2006) believe that stakeholders including as creditors, managers, investors, employees, and others suffer significant personal losses as a result of bankruptcy. Meanwhile, if the volume is large enough, it will have an impact on the country's economic progress.

Agrawal Ankit and Patni Ity (2019) examined the Z-score, Ohlson, Zmijewski, Springate, and Grover models in terms of their ability to forecast a company's financial soundness. The Zmijewski and Springate model is the best model for predicting financial health, according to the results. They also recommended that at the time of investment, investors have to focus on Zmijewski and Springate model because both are early forecaster models.

The study carried out by Indriyanti Mia (2019) study for measuring accuracy of financial distress models in prediction of financial health of world's largest technological companies using compared Ohlson, Z-score, Springate, Grover, Taffler, Fulmer and Zmijewski financial distress models. The study predicted Grover model got highest accuracy level i.e. 96.6%, followed by Z-score model with the accuracy level of 86.60%. Researcher concluded conclude that Grover financial distress model is superior model in prediction of financial health of companies.

## OBJECTIVES OF THE STUDY

- 1) To examine the financial distress status or financial health of a sample company.
- 2) To check the efficacy of bankruptcy models in prediction of financial health of companies.

## SAMPLE DESIGN

Three Sample Company i.e DHFL (Dewan Housing Finance Corporation Limited). ILFS Infrastructure Leasing & Financial Services Limited and Srei Infrastructure Finance Ltd is selected for the purpose of this study. This research is based on secondary data acquired from publicly available sources i.e. Annual reports of the sample company and from the website www.google.com for the period of five years (2014-15 to 2018-19).

## TOOLS AND TECHNIQUES

In this study, Springate S Score and Grover G Score model are used. Analysis has been done using Excel.

### a) Springate Model

Springate model was the first model to be introduced by Gordon LV Springate (1978). Basically, this model is a revolution of the Altman model developed by Multiple Discriminant Analysis (MDA). Springate model development process initially used 19 financial ratios that have been frequently used. However, after testing, Springate finally chose four financial ratios to be used to determine whether the company is said to be either a healthy company or potentially insolvent. Springate is also a model that can be used as an early warning system of bankruptcy.

Equation models proposed by Springate are:

$$S = 1.03A + 3.07B + 0.66C + 0.4D$$

Description:

A = Working Capital or Total Assets

B = Net Profit before Interest and Taxes or Total Assets

C = Net Profit before Taxes or Current Liabilities

D = Sales or Total Asset

S-Score Scale

Prediction

S > 0.862

Not Bankrupt

S < 0.862

Bankrupt

### b) Grover Model

Grover Model is a model created by restoration or redesigns of the model of the Altman Z-Score. It takes X1 and X3 of the Altman model and then adds profitability ratios which are indicated by ROA.

Equation in this is as follows:

$$G = 1.650X1 + 3.404X2 - 0.016ROA + 0.057$$

Description:

X1 = Working capital or Total assets

X2 = Earnings before interest and taxes or total assets

ROA = net income or total assets

G-Score Scale

Prediction

G ≤ -0.02

Bankrupt

G ≥ 0.01

Not Bankrupt

## ANALYSIS AND INTERPRETATION

### Springate model

Springate model analytic result can be seen as follow:

Table 1: Springate Analysis Result

| Springate S-Score | 2015       | 2016       | 2017       | 2018       | 2019       |
|-------------------|------------|------------|------------|------------|------------|
| DHFL              | -0.02      | 0.07       | 0.28       | 0.044      | 0.07       |
|                   | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy |
| ILFS              | 0.03       | 0.17       | 0.2        | -0.002     | -13.87     |
|                   | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy |
| Srei              | -0.2       | -0.26      | -0.15      | 0.12       | 0.19       |
|                   | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy | Bankruptcy |

The above table No.1 shows calculated Springate score of all three companies included in sample, namely DHFL, ILFS and Srei, we can observe that all three companies are consistently for all the study periods i.e. 2015-2019 is below 0.0862 hence, these companies found financially distressed and in bankruptcy zone.

Grover model

Grover model analytic result can be seen as follow:

Table 2: Gover Analytic Result

| Grover G Score | 2015           | 2016           | 2017           | 2018           | 2019            |
|----------------|----------------|----------------|----------------|----------------|-----------------|
| DHFL           | -0.15          | -0.01          | 0.2            | -0.03          | 0.12            |
|                | Bankruptcy     | Not-Bankruptcy | Not-Bankruptcy | Bankruptcy     | Not- Bankruptcy |
| ILFS           | 0.35           | 0.19           | 0.22           | -0.03          | -16.56          |
|                | Not-Bankruptcy | Not-Bankruptcy | Not-Bankruptcy | Bankruptcy     | Bankru Ptcy     |
| Srei           | -0.36          | -0.45          | -0.3           | 0.17           | 0.27            |
|                | Bankruptcy     | Bankruptcy     | Bankruptcy     | Not-Bankruptcy | Not- Bankruptcy |

In 2015, the company predicted to experience bankruptcy was DHFL, ILFS and Srei.

In 2016 and 2017, there was only one additional company which was predicted to experience bankruptcy. The company was Srei. While companies which were not predicted to experience bankruptcy were DHFL and ILFS.

In 2018, two companies was predicted to experience bankruptcy was DHFL and ILFS. While in 2019, only one company i.e. ILFS was predicted to experience bankruptcy.

Table 3: Average Springgate model and Grover model

|      | S Score    | G Score         |
|------|------------|-----------------|
| DHFL | 0.09       | 0.03            |
|      | Bankruptcy | Not -Bankruptcy |
| ILFS | -2.64      | -3.17           |
|      | Bankruptcy | Bankruptcy      |
| Srei | -0.06      | -0.13           |
|      | Bankruptcy | Bankruptcy      |

Figure 1 Average Springgate score and Grover score

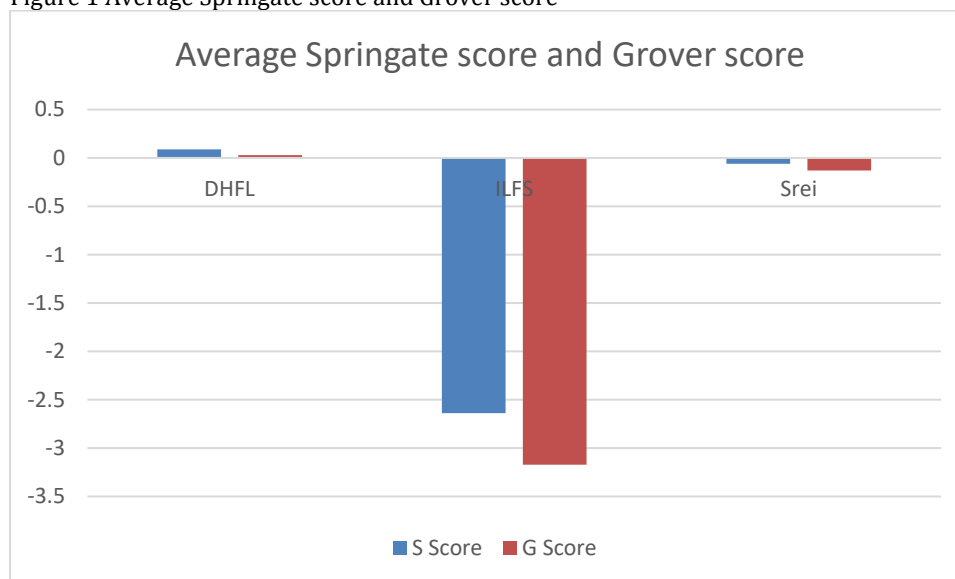


Table No.3 shows Average Springgate score of selected sample companies. For the Study Period 2014-15 to 2018-19. From the above table it can observed that all three namely DHFL, ILFS and Srei companies found as a financially distressed companies as S score found below 0.862 As per Grover score only one company (DHFL) is found solvent and rest two companies, ILFS and Srei are financially distressed.

Figure1 indicates Average Springgate score and Grover score of Selected companies for the study period 2014-15 to 2018-19.From the above chart it can be seen clearly that S score and G score of ILFS is the most financially distressed NBFC followed by Srei and DHFL. As per Grover score DHFL is solvent company.

## CONCLUSION

Every stakeholder in an organization is concerned about the company's financial health. Financial health determines the company's growth prospects and, consequently, its investment worthiness. If a company is financially stable, it has a better chance of succeeding. In this research paper researcher analyze financial distress of three bankrupt NBFCs for the study period 2014-15 to 2018-19 by using Springgate S score model and Grover G score model. Results of the study revealed that all three NBFCs namely DHFL, ILFS and Srei were

financially distressed as per Score model. The calculation of Grover's model gave inconsistent results. When comparisons were made between the two bankruptcy analysis models, Sprigate recorded accurate results.

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