



Financial Distress Analysis of Technology Companies Using Grover Model [†]

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Abstract: The decision-making process is of utmost importance as it dictates what will be chosen. Good decision making may lead to an ideal result that decision makers wish to achieve. Decision-making process is an essential consideration for the organization and investors before making decisions. Proper and thorough planning can help the investors make good decisions and, hence, gain profits. As a result, it is important to conduct a financial distress analysis of companies in order to understand their financial condition. In this study, the financial performance of technology companies is assessed using the Grover model. Financial ratios, such as working capital to total assets, earnings before interest and taxes to total assets, and net income to total assets, are analyzed in this study with the Grover model. Each of the companies will obtain a G-score based on their financial performance. The Grover model is capable of categorizing companies either in safe, grey or distress zones. The findings of this paper depict that 28 companies are performing well during the period of study. It indicates that these companies are performing well in terms of financial performance. Therefore, this provides insights to investors to identify companies with good financial performance for investment. Furthermore, the identified companies in the safe zone can serve as a reference to other companies for benchmarking.

Keywords: grovel model; financial distress; financial ratios; technology companies



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1. Introduction

Nowadays, the business environment is fast-moving and complex. Decision making is very challenging due to the current levels of uncertainty and ambiguity [1]. In the scenario of investment, investors usually need to make numerous decisions. The decisions made by the investors can be either complex or simple, with a low or high impact [2]. Therefore, it is very crucial for investors to conduct many kinds of research and analyses before making an optimal decision. The selection of the stock for investment is a decision-making process that involves much research and studies. Decision making in investment can never be an easy task especially without proper and thorough planning and investigation.

Investors need to do numerous research before making an investment decision. A thorough and detailed analysis should be carried out in order to increase the confidence of the investors during the process of investment decision making. Decision making plays a central role in business management. Making the right decision at the right time is extremely important for business and company [3]. Decision making is defined as the act of selecting between two or more available alternatives [3,4]. Effective and successful decision making can help the organization to gain profits. On the other hand, ineffective or poor decision making will cause losses for the organization. Therefore, the process of decision making should be carried out by the organization and investors in order to obtain maximum profits and benefits.

Grover model has been applied in various fields, for instance, Indonesia Stock Exchange [5,6], retail trade subsectors [7], consumer goods company [8] and coal subsector mining companies [9]. As a result, Grover model is suitable to be adopted to evaluate the financial condition of the companies. The main goal of this study is to determine the financial status of the companies as well as to provide a reference of companies that are not financially sound for benchmarking purposes. In this study, the financial condition of the companies is determined by Grover model. By getting the company financial data from the financial statements, the financial status of the companies can be determined and identified [10,11]. Moreover, this study can serve as a reference for investors to comprehend the current financial status of the companies. Financial performance analysis of the companies is important in the decision-making process carried out by the organization and investors [12,13]. This study is significant in identifying the financial status of the companies as well as in providing a benchmark of companies that are not financially sound so as to make improvements in the future. The structure of the paper is presented as follows: Section 2 contains the methods used in this study. The results and discussion of this study are presented in Section 3. Lastly, a conclusion is drawn at the end of this paper.

2. Methods

In this paper, the financial performance of the companies is evaluated using Grover model. Based on past studies, the Grover model is a well-known tool that is utilized to assess the financial performance of companies. The companies investigated in this study are listed technology companies in Bursa Malaysia. The period of the study is from the year 2016 to 2020.

The financial performance of the companies is measured using the Grover model. The formulation of the Grover model is shown below [14–16]:

$$\text{G-score} = 1.650X_1 + 3.404X_2 - 0.016X_3 + 0.057$$

where

$$\begin{aligned} X_1 &= \frac{\text{working capital}}{\text{total assets}} \\ X_2 &= \frac{\text{earnings before interest and taxes}}{\text{total assets}} \\ X_3 &= \frac{\text{net income}}{\text{total assets}} \end{aligned}$$

For Grover model, three important financial ratios are taken into consideration to determine the performance of the company. The three financial ratios include working capital to total assets, earnings before interest and taxes to total assets, and net income to total assets. Each of the companies will achieve a G-score based on their performance. After that, the companies will be categorized in either one of three different zones. The companies could fall in the safe zone, grey zone or distress zone. If the company is able to obtain a G-score of at least 0.01, the company will be categorized in the safe zone. In other words, the company is performing well in terms of financial performance, and the company is financially stable. If the company achieves a G-score of lower than -0.02 , it indicates that the company shows poor performance, and hence, the company is grouped in the distress zone. The company is facing financial distress if the company is categorized in the distress zone. Lastly, the companies that achieve a G-score between -0.02 and 0.01 will be classified in the grey zone [17].

3. Results and Discussion

In this study, Grover model is proposed to examine the financial performance of the listed technology companies. Table 1 depicts the values of the three financial ratios for 32 companies and the company G-scores for the year 2020.

Table 1. G-scores for the year 2020.

Company	X ₁	X ₂	X ₃	G-Score	Zone
ARBB	0.3620	0.1810	0.1702	1.2677	Safe
CENSOF	0.2405	−0.6412	−0.6502	−1.7186	Distress
CUSCAPI	0.2760	−0.1704	−0.1931	−0.0648	Distress
D&O	0.2425	0.0871	0.0645	0.7527	Safe
DATAPRP	0.5810	−0.2257	−0.2301	0.2512	Safe
DIGISTA	0.0700	0.0511	−0.0077	0.3467	Safe
DSOINIC	0.3008	0.1762	0.1554	1.1506	Safe
EDARAN	0.0528	0.0660	−0.0648	0.3697	Safe
EFORCE	0.4422	0.1384	0.1051	1.2560	Safe
ELSOFT	0.6496	0.0413	0.0060	1.2692	Safe
FRONTKN	0.4925	0.1830	0.1326	1.4906	Safe
GHLSYS	0.3394	0.0461	0.0197	0.7735	Safe
GTRONIC	0.5318	0.1465	0.1522	1.4308	Safe
HTPADU	0.1259	0.0476	0.0291	0.4263	Safe
INARI	0.4991	0.1092	0.1064	1.2504	Safe
ITRONIC	0.0345	−0.0247	−0.0259	0.0303	Safe
JCY	0.5099	0.0097	0.0226	0.9309	Safe
JHM	0.3715	0.0945	0.0638	0.9905	Safe
KESM	0.5660	0.0340	0.0002	1.1067	Safe
MMSV	0.7710	0.0020	0.0279	1.3355	Safe
MPI	0.4250	0.1024	0.0761	1.1056	Safe
MSNIAGA	0.3665	−0.0582	−0.0514	0.4646	Safe
MYEG	0.2836	0.1969	0.1896	1.1922	Safe
NOTION	0.2546	−0.0122	0.0112	0.4352	Safe
OMESTI	−0.0629	0.0817	0.0574	0.2304	Safe
PENTA	0.6117	0.1279	0.0851	1.5004	Safe
THETA	0.8060	−0.0513	−0.0942	1.2138	Safe
TURIYA	−0.0222	0.0254	0.0029	0.1068	Safe
UNISEM	0.3132	0.0773	0.0629	0.8360	Safe
VITROX	0.5618	0.1447	0.1390	1.4745	Safe
VSTECS	0.5219	0.0763	0.0658	1.1769	Safe
WILLOW	0.6389	0.0705	0.0846	1.3498	Safe

According to Table 1, each of the companies is able to obtain a G-score based on their financial performance. The companies that fall in the safe zone are ARBB, D&O, DATAPRP, DIGISTA, DSONIC, EDARAN, EFORCE, ELSOFT, FRONTKN, GHLSYS, GTRONIC, HTPADU, INARI, ITRONIC, JCY, JHM, KESM, MMSV, MPI, MSNIAGA, MYEG, NOTION, OMESTI, PENTA, THETA, TURIYA, UNISEM, VITROX, VSTECS and WILLOW. As the G-scores of these companies are more than 0.01, this indicates that these companies are performing well in terms of financial performance in the year 2020. It also shows that these 30 companies (93.75%) are financially stable. On the other hand, the G-scores achieved by CENSOF and CUSCAPI are −1.7186 and −0.0648, respectively. Thus, it clearly shows that CENSOF and CUSCAPI are grouped in the distress zone as their G-scores are less than −0.02. Therefore, these two companies (6.25%) are in financial distress. The findings demonstrate that CENSOF and CUSCAPI do not show good financial performance. As a recommendation, CENSOF and CUSCAPI can consider other well-performing companies as a benchmark to devise future improvements.

Table 2 presents the G-scores of technology companies for the years 2016, 2017, 2018, 2019 and 2020.

Table 2. G-scores for the years 2016, 2017, 2018, 2019 and 2020.

Company	2016	2017	2018	2019	2020
ARBB	−1.3306	−0.0767	1.4200	1.9092	1.2677
CENSOF	0.7785	0.0556	0.0094	0.1204	−1.7186
CUSCAPI	−1.4839	−0.9921	0.1854	0.3682	−0.0648
D&O	0.6465	0.7650	0.7650	0.7084	0.7527
DATAPRP	0.9546	0.8456	0.6485	−0.6526	0.2512
DIGISTA	0.8332	0.6696	0.7002	0.5451	0.3467
DSOINIC	1.2231	1.1538	1.1684	0.8880	1.1506
EDARAN	0.0594	−0.0023	0.4991	0.2082	0.3697
EFORCE	1.2188	1.6242	1.1765	1.1309	1.2560
ELSOFT	1.8521	1.9120	2.1109	1.3970	1.2692
FRONTKN	0.8930	0.9134	1.2776	1.4234	1.4906
GHLSYS	0.7037	0.7105	0.7003	0.7317	0.7735
GTRONIC	1.3425	1.0953	1.3944	1.3028	1.4308
HTPADU	0.4954	0.2917	−0.0605	0.4930	0.4263
INARI	1.3705	1.4374	1.5981	1.4022	1.2504
ITRONIC	−0.5846	−0.6386	−0.2661	0.0376	0.0303
JCY	0.7821	0.8206	0.6810	0.7206	0.9309
JHM	1.1431	1.6939	1.3090	1.1964	0.9905
KESM	0.9574	0.8263	1.0194	0.9276	1.1067
MMSV	1.6917	2.2131	1.7395	1.7319	1.3355
MPI	1.1800	1.2222	1.1036	1.1864	1.1056
MSNIAGA	0.7426	0.8594	0.5643	0.4910	0.4646
MYEG	1.1825	1.3556	1.0087	0.9500	1.1922
NOTION	0.7053	0.7568	1.1096	0.6059	0.4352
OMESTI	0.1569	0.1264	−1.3098	−0.0681	0.2304
PENTA	1.5652	1.2951	1.5424	1.6734	1.5004
THETA	1.0277	1.1431	1.2046	1.2749	1.2138
TURIYA	0.1741	0.1802	0.1811	0.1837	0.1068
UNISEM	0.6766	0.7634	0.6077	0.5055	0.8360
VITROX	1.4849	1.5227	1.5906	1.4284	1.4745
VSTECS	1.1260	1.1698	1.1569	1.0434	1.1769
WILLOW	1.6118	1.4879	1.3787	1.4106	1.3498

Based on Table 2, it is observed that 24 companies fall in the safe zone throughout the 5-year period and account for 75%. On the one hand, there are eight companies that are categorized either in the grey zone or distress zone in certain years. These companies include ARBB, CENSOF, CUSCAPI, DATAPRP, EDARAN, HTPADU, ITRONIC and OMESTI. As a result, the financial performance of these companies should be monitored properly so that these companies can make adequate improvements and avoid entering the grey zone or distress zone again in the future. Throughout the 5-year period, two companies were in the distress zone three out of five times. Therefore, CUSCAPI and ITRONIC need more attention and effort for improving their financial performances.

Table 3 shows the average G-score of each company for the 5-year period.

Based on the results, there are a total of 28 technology companies (87.5%) performing well over the 5-year period, i.e., from 2016 to 2020. As a result, these financially healthy companies are grouped in the safe zone. These companies consist of ARBB, D&O, DATAPRP, DIGISTA, DSONIC, EDARAN, EFORCE, ELSOFT, FRONTKN, GHLSYS, GTRONIC, HTPADU, INARI, JCY, JHM, KESM, MMSV, MPI, MSNIAGA, MYEG, NOTION, PENTA, THETA, TURIYA, UNISEM, VITROX, VSTECS and WILLOW. Among the financially healthy companies, MMSV is the best based on performance as it obtained the highest G-score, i.e., 1.7423. In other words, MMSV outperformed other companies. On the other hand, the companies that experienced financial distress over the study period are CENSOF, CUSCAPI, ITRONIC and OMESTI. These companies performed under par. The percentage of companies that are in the financial distress zone is 12.5%. Based on the findings, CUSCAPI achieved the lowest G-score, i.e., −0.3974. Thus, CUSCAPI is classified as the most

underperforming company. Finally, these financially unsound companies need to take immediate action in order to improve their financial performance. The companies with good financial performance serve as a benchmark for companies with low financial performance, such as CENSOF, CUSCAPI, ITRONIC and OMESTI, for future improvements.

Table 3. Average G-score for the 5-year period.

Company	Average G-Score	Zone
ARBB	0.6379	Safe
CENSOF	−0.1510	Distress
CUSCAPI	−0.3974	Distress
D&O	0.7275	Safe
DATAPRP	0.4095	Safe
DIGISTA	0.6190	Safe
DSOINIC	1.1168	Safe
EDARAN	0.2268	Safe
EFORCE	1.2813	Safe
ELSOFT	1.7082	Safe
FRONTKN	1.1996	Safe
GHLSYS	0.7239	Safe
GTRONIC	1.3132	Safe
HTPADU	0.3292	Safe
INARI	1.4117	Safe
ITRONIC	−0.2843	Distress
JCY	0.7870	Safe
JHM	1.2666	Safe
KESM	0.9675	Safe
MMSV	1.7423	Safe
MPI	1.1596	Safe
MSNIAGA	0.6244	Safe
MYEG	1.1378	Safe
NOTION	0.7225	Safe
OMESTI	−0.1728	Distress
PENTA	1.5153	Safe
THETA	1.1728	Safe
TURIYA	0.1652	Safe
UNISEM	0.6778	Safe
VITROX	1.5002	Safe
VSTECs	1.1346	Safe
WILLOW	1.4478	Safe

4. Conclusions

Decision making is important in every aspect. Good decision making can lead to a better outcome. It is extremely beneficial for investors and the organization. Proper planning can aid better insight into a situation, and hence, it can reduce unnecessary risk and uncertainty. Decision making in investment required careful planning. The importance of analyzing and studying the stock market cannot be ignored as thorough research plays an imperative role during the process of investment decision making. Therefore, this study aimed to evaluate the financial condition of the companies with Grover model. Grover model takes three important financial ratios into consideration to assess the financial performance of the companies. The major finding of this study was that 28 technology companies exhibited good financial performance over the study period from 2016 to 2020. Moreover, this study also serves as a good reference for underperforming companies to improve their financial performance. For future research, Grover model is recommended to measure the performance of the company from different sectors.

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