

Analysis on the Level of Financial Distress of Company Using the Grover Model

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Abstract

Purpose: Technology companies play a central role in driving technological advancements, serving as catalysts for economic growth, societal transformation, and innovation. Their ability to introduce cutting-edge products, improve efficiency, and shape consumer behavior underscores their strategic importance in the global economy. Consequently, analyzing their financial performance is essential, not only to understand their current financial standing but also to gauge their resilience and long-term sustainability. This study aims to assess the financial distress level of companies in the technology sector using the Grover model.

Design/methodology/approach: A total of 24 companies are investigated to determine their levels of financial distress over the period from the year 2021 to 2024. The Grover model is a financial distress prediction tool that effectively identifies the financial distress levels of companies by categorizing them into safe, grey, or distress zones based on calculated G-scores.

Findings: The findings of this study reveal that the technology companies analyzed fall within the safe zone across the four-year study period, demonstrating overall financial stability. Notably, the top five performing companies are UWC, INARI, MMSV, FRONTKN, and VITROX. **Originality/value:** This study is significant as it evaluates financial performance by determining financial distress levels using the Grover model. This study contributes to the understanding of financial health in the technology sector by providing empirical evidence of stability among leading companies. Maintaining strong financial performance is crucial for sustaining competitive advantage in an evolving market landscape. The top-performing companies identified in this study can serve as benchmarks for other companies seeking to enhance their financial strategies and long-term growth potential.

Keywords: Grover Model, Level of Financial Distress, Financial Ratio

Introduction

The rapid growth of technology in the current era of globalization has provided numerous advantages, fostering progress across various sectors. One significant impact of technological advancement is the emergence of the information society, characterized by the widespread

dissemination and accessibility of information (Butar-butur and Bako, 2024). The expansion of information and communication technology has notably enhanced the quality of human life. Human civilization experienced a significant transformation following the development of computers in the mid-20th century (Kurniawati, 2022). Technology promotes innovation by offering companies opportunities to create new products and services, experiment with novel techniques, and improve existing ones (Trivedi et al., 2023). Emerging technologies such as the Internet of Things (IoT), artificial intelligence (AI), and 3D printing are currently driving innovation across various industries. Many enterprises have begun utilizing internet-based and technological systems to reduce operating costs, enhance efficiency, and enable real-time data and information exchange across diverse platforms with partners worldwide (Ciobanu and Neamțu, 2017). Technological development is also crucial for businesses as it enables them to promote their products through online methods and attract consumers to their online platforms (Susan and Novianti, 2019). Moreover, digital technology serves as the driving force behind Industry 4.0, with nearly all innovations in this domain stemming from digitalization (Schwab, 2016; Hizam-Hanafiah and Soomro, 2021). Consequently, the development of technology sector companies is imperative, as they act as catalysts for innovation, economic growth, and societal transformation. Therefore, evaluating the financial performance of these companies periodically is essential to monitor their current financial standing.

Previous studies have utilized the Grover model to assess the financial distress level of companies across various sectors, including telecommunications (Fauzi et al., 2021), retail (Sugiyarti and Murwaningsari, 2020), Malaysian enterprises (Chin et al., 2025), transportation (Supitriyani et al., 2022), startups (Pramesti and Yuniningsih, 2023), non-cyclical consumer goods (Kembi et al., 2024), and food and beverage (Fauziah and Mudzakar, 2022). The Grover model effectively evaluates a company's financial health by calculating the G-score, which categorizes companies into distress, grey, or safe zones based on their financial distress level. This study aims to determine the G-scores of companies over the period from the year 2021 to 2024 using the Grover model. By evaluating financial distress levels, this research provides valuable insights for investors and companies to understand their current financial standing. The structure of this paper is organized as follows: The next section outlines the research methodology. The results and discussion are then presented. Finally, the last section concludes with some final remarks.

Methods

In this study, the financial distress level of technology sector companies in Malaysia is investigated using the Grover model. A total of 24 companies are analyzed over the study period from the year 2021 to 2024. The Grover model calculates a G-score for each company, facilitating the assessment of their financial health and the detection of financial distress. Although the Grover model is a relatively simple and well-established method, this study contributes to the literature by applying it within the context of Malaysia's technology sector, which has been underexplored in financial distress prediction research. The findings provide context-specific insights into the financial health of technology companies operating in an emerging market. Despite the small sample size of 24 companies, the study captures a focused and representative set of companies to evaluate model applicability. Moreover, the simplicity of the Grover model enhances its practical relevance, allowing analysts and investors to easily assess financial stability without complex statistical tools.

The formulation of the Grover model is presented as follows (Wahyuningsih and Venusita, 2022; Martini et al., 2023):

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

where

$$X_1 = \frac{\text{working capital}}{\text{total assets}}$$

$$X_2 = \frac{\text{earnings before interest and taxes}}{\text{total assets}}$$

$$X_3 = \frac{\text{net income}}{\text{total assets}}$$

The Grover model evaluates a company's financial health by analyzing three key financial ratios: net income to total assets, earnings before interest and taxes (EBIT) to total assets, and working capital to total assets (Pratiwi et al., 2023; Usmansyah and Pudjiastuty, 2023). After calculating the G-score for each company, they are categorized into one of three zones: safe, grey, or distress zones. The companies with a G-score of at least 0.01 are considered financially stable, indicating good performance and financial health (Simatupang et al., 2024). The companies with a G-score between -0.02 and 0.01 fall into the grey zone, suggesting moderate financial health and potential risks (CH et al., 2024). The companies with a G-score less than -0.02 are falling into the distress zone (Seto, 2022; Mustafa et al., 2023). The companies are facing financial distress and require immediate remedial actions to improve their financial performance and avoid potential bankruptcy. This classification aids stakeholders and investors in identifying the financial health of companies, providing valuable insights for decision-making.

Results and Discussions

The Grover model is used to assess the financial distress level of technology companies between 2021 and 2024. Based on their obtained G-scores, these companies are categorized into safe, grey, or distress zones. Table 1 presents the G-scores of the companies for the year 2024.

Table 1
G-scores for the year 2024

Company	X_1	X_2	X_3	G-Score	Zone
AWANTEC	0.3925	0.0083	0.0056	0.7326	Safe
CENSOF	0.4890	0.0581	0.0389	1.0609	Safe
CTOS	-0.0561	0.1049	0.0862	0.3202	Safe
D&O	0.2619	0.0373	0.0235	0.6158	Safe
FRONTKN	0.5130	0.2015	0.1528	1.5871	Safe
GENETEC	0.6344	0.1600	0.1494	1.6462	Safe
GREATEC	0.3998	0.1517	0.1394	1.2308	Safe
INARI	0.6741	0.0691	0.0845	1.4030	Safe
JCY	0.5465	0.0416	0.0371	1.0996	Safe
JFTECH	0.5056	0.0304	0.0413	0.9942	Safe
KESM	0.4880	0.0002	0.0004	0.8630	Safe
MICROLN	0.2022	-0.0341	-0.0782	0.2757	Safe
MMSV	0.7595	-0.0167	-0.0087	1.2534	Safe

MPI	0.3809	0.0755	0.0788	0.9411	Safe
NEXG	0.5690	0.2598	0.1970	1.8771	Safe
NOTION	0.2971	0.1022	0.0742	0.8940	Safe
OPENSYS	0.4026	0.1342	0.0942	1.1768	Safe
PENTA	0.4071	0.0691	0.0773	0.9628	Safe
SNS	0.3379	0.0909	0.0595	0.9229	Safe
TURIYA	0.0465	0.0384	0.0185	0.2640	Safe
UNISEM	0.0998	0.0260	0.0210	0.3100	Safe
UWC	0.5256	0.0370	0.0254	1.0500	Safe
VITROX	0.5583	0.0966	0.0744	1.3059	Safe
VSTECS	0.5057	0.0999	0.0759	1.2303	Safe

According to Table 1, the financial ratios such as working capital to total assets (X_1), earnings before interest and taxes to total assets (X_2), and net income to total assets (X_3) are determined for each company. Subsequently, the G-scores for each company are calculated using the Grover model. Among the companies analyzed, TURIYA records the lowest G-score of 0.2640, while NEXG achieves the highest G-score of 1.8771. Since all these companies have G-scores of at least 0.01, they are categorized within the safe zone, indicating strong financial performance. The companies classified in the safe zone are AWANTEC, CENSOF, CTOS, D&O, FRONTKN, GENETEC, GREATEC, INARI, JCY, JFTECH, KESM, MICROLN, MMSV, MPI, NEXG, NOTION, OPENSYS, PENTA, SNS, TURIYA, UNISEM, UWC, VITROX, and VSTECS. This classification implies that these technology companies are financially stable and performed well in the year 2024.

The G-scores for the companies for the years 2021, 2022, 2023, and 2024, as determined by the Grover model, are depicted in Table 2.

Table 2
G-scores for the years 2021, 2022, 2023, and 2024

Company	2021	2022	2023	2024
AWANTEC	0.8094	0.7526	0.6588	0.7326
CENSOF	1.7457	1.5086	1.1587	1.0609
CTOS	0.6754	0.3087	0.3755	0.3202
D&O	0.9923	0.7482	0.6445	0.6158
FRONTKN	1.4548	1.4509	1.4679	1.5871
GENETEC	0.5956	1.4756	1.5533	1.6462
GREATEC	1.5282	1.0249	1.0758	1.2308
INARI	1.5270	1.7102	1.5753	1.4030
JCY	0.7089	0.5268	0.5155	1.0996
JFTECH	1.7125	1.3976	1.2100	0.9942
KESM	1.1118	0.8850	0.8218	0.8630
MICROLN	0.9272	0.9145	0.8521	0.2757
MMSV	1.7518	1.8433	1.2078	1.2534
MPI	1.1123	1.0330	0.7133	0.9411
NEXG	0.7048	1.0020	1.7296	1.8771
NOTION	0.3183	0.6239	0.2288	0.8940
OPENSYS	1.2818	1.3344	1.1612	1.1768
PENTA	1.3738	1.3272	1.1693	0.9628
SNS	0.8708	1.0220	1.2810	0.9229
TURIYA	0.2320	0.2344	0.2716	0.2640
UNISEM	0.7126	0.6935	0.4709	0.3100
UWC	2.0250	2.0021	1.4811	1.0500
VITROX	1.5396	1.6035	1.3960	1.3059
VSTECS	1.2007	1.2576	1.1910	1.2303

Based on Table 2, the G-scores for each technology company for the years 2021, 2022, 2023, and 2024 are computed. In 2021, the G-scores ranged from 0.2320 to 2.0250. For the year 2022, the range of the G-scores is from 0.2344 to 2.0021. UWC records the highest G-score in both years 2021 and 2022, while TURIYA achieves the lowest G-score in those years. For the year 2023, the range of the G-scores is from 0.2288 to 1.7296. NOTION obtains the lowest G-score of 0.2288. The highest G-score of 1.7296 is obtained by NEXG. For the year 2024, NEXG continues to lead with the highest G-score of 1.8771, whereas TURIYA records the lowest G-score of 0.2640. These results suggest that TURIYA may need to implement strategies to enhance its financial performance and improve its G-score in the future. Based on the G-scores achieved by the companies, all are classified into the safe zone, as their G-score are at least 0.01 from the year 2021 to 2024.

Table 3 displays the average G-scores of the companies over the four-year period.

Table 3

The average G-score for the 4-year period

Company	Average G-Score	Zone
AWANTEC	0.7383	Safe
CENSOF	1.3685	Safe
CTOS	0.4200	Safe
D&O	0.7502	Safe
FRONTKN	1.4901	Safe
GENETEC	1.3177	Safe
GREATEC	1.2150	Safe
INARI	1.5539	Safe
JCY	0.7127	Safe
JFTECH	1.3286	Safe
KESM	0.9204	Safe
MICROLN	0.7424	Safe
MMSV	1.5141	Safe
MPI	0.9499	Safe
NEXG	1.3284	Safe
NOTION	0.5162	Safe
OPENSYS	1.2385	Safe
PENTA	1.2083	Safe
SNS	1.0242	Safe
TURIYA	0.2505	Safe
UNISEM	0.5467	Safe
UWC	1.6395	Safe
VITROX	1.4612	Safe
VSTECS	1.2199	Safe

Table 3 presents the average G-scores of the companies over the four-year period from 2021 to 2024, as determined by the Grover model. These scores range from 0.2505 to 1.6395. The companies include AWANTEC, CENSOF, CTOS, D&O, FRONTKN, GENETEC, GREATEC, INARI, JCY, JFTECH, KESM, MICROLN, MMSV, MPI, NEXG, NOTION, OPENSYS, PENTA, SNS, TURIYA, UNISEM, UWC, VITROX, and VSTECS are all classified within the safe zone, as their G-scores are at least 0.01, indicating financial stability. Among these, TURIYA has the lowest overall G-score of 0.2505, while UWC achieves the highest at 1.6395. The second highest G-score is obtained by INARI followed by MMSV, FRONTKN, and VITROX. The G-score that obtained by INARI, MMSV, FRONTKN, and VITROX are 1.5539, 1.5141, 1.4901, and 1.4612, respectively.

Hence, the companies such as UWC, INARI, MMSV, FRONTKN, and VITROX are the five top-performing companies. As a result, these companies can serve as benchmarks for others aiming to enhance their financial performance. Companies with lower G-scores may consider adopting strategies from these leading firms to avoid financial distress or slipping into the grey zone in the future. In summary, the findings show that all 24 technology companies are classified in the safe zone based on the Grover model, indicating that none are experiencing financial distress. This result suggests the overall financial soundness of Malaysia's technology sector, likely due to strong post-pandemic performance and the continued digitalization trend. This finding also aligns with past studies, which show that all the companies fall within the safe zone during the study period (Magdalena and Rusmanto, 2022; Pramesti and Yuniningsih, 2023). The results imply that the Grover model identifies companies as financially stable, but future studies could consider incorporating sector-specific variables to improve prediction accuracy. This study offers a useful tool for policymakers, financial analysts, and investors to assess the technology companies' financial health more accurately. By applying the Grover model, stakeholders can identify early warning signs of potential financial distress, enabling timely intervention and more informed investment decisions.

Conclusion

The purpose of this study is to assess the financial distress level of technology companies using the Grover model. This model classifies companies into distress, grey, or safe zones based on their G-scores. The classification depends on the G-score obtained by each company through the application of the Grover model. The findings demonstrate that technology companies exhibit good overall financial performance during the study period between the years 2021 and 2024. All the companies investigated in this study fall into the safe zone, indicating financial stability. Over the years, TURIYA records the lowest G-score among the companies. Therefore, TURIYA may need to implement initiatives to improve its G-score to avoid falling into the grey or distress zones in the future. Conversely, UWC can serve as a benchmark for other companies aiming for further improvement. In the future, the Grover model can be adopted to assess the financial distress level of companies across various sectors.

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