Bankruptcy Prediction Model in Service Companies during the Covid 19 Pandemic: A Comparative Analysis

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Abstract:
This research aims to analyze differences in bankruptcy prediction models for service companies carried out in hotel, restaurant and tourism companies in Indonesia. This is very interesting to study considering the importance of companies predicting early the possibility of bankruptcy. The number of samples in this research was 20 service companies that were included in the sampling technique criteria. The data analysis used to test the hypothesis is the difference test using the analysis of variance (ANOVA) method. The results of the analysis show that there are differences in bankruptcy prediction models for service companies during the Covid-19 pandemic. The results of this research can be used as a reference for service companies to be able to choose the most appropriate prediction model in order to minimize the risk of bankruptcy.

Keywords: bankruptcy prediction model, Indonesian economy, Covid-19 pandemic consequences.

Introduction
The development of the Indonesian economy after escaping the Covid-19 pandemic has begun to grow again. Since the pandemic occurred, the Indonesian economy has experienced a downward trend and this has happened globally. The sectors most impacted by the pandemic are the service sectors such as hotels, tourism and restaurants.

Based on data from the Ministry of Tourism and Creative Economy, in the tourism sector the number of foreign visitors visiting Indonesia has decreased by 74.84%. This data is based on data on the number of visitors in 2020 against the number of visitors in 2019. The three main entrances such as Ngurah Rai experienced a decrease of 83.02%; Soekarno-Hatta experienced a decline of 82.01%; and Batam experienced a decline of 84.84%.

In the hotel and restaurant sector, as many as 2,000 hotels and 8,000 restaurants experienced closure, which has the potential to lose income during the first semester of 2020 with a value of IDR 70,000,000,000,000 (idxchanel.com). For more details, see the following table.
Based on Figure 1, it can be seen that in 2020 most of the tourism, hotel and restaurant sector service companies experienced a decline. Only 7 companies are still surviving, even though they have a downward trend compared to the previous year. The consequences that can arise if this incident is not resolved will lead to bankruptcy.

According to Karina (2014) bankruptcy is a condition where company funds are insufficient to carry out business activities again. If the company does not operate, it will certainly reduce the company’s profits. Therefore, companies must try to prevent bankruptcy. This can be done with bankruptcy prediction analysis.

Bankruptcy predictions can be analyzed through several prediction models such as Altman's Z-Score Model, Zmiejewski's X-Score Model, Grover's G-Score Model, Springate's S-Score Model. These models can be used as an early warning effort to identify early symptoms of bankruptcy. Therefore, it is necessary to study in more depth whether these models have differences in measuring or predicting bankruptcy, especially in service companies in the tourism, hotel and restaurant sectors.

**Methodology**

This type of research uses comparative research, where according to Sugiyono (2016) states that comparative research is research that compares the existence of one or more variables. The population of this research is all tourism, hotel and restaurant service companies, totaling 35 companies. The sampling technique uses purposive sampling with several criteria as follows:

1. The company was listed on the Indonesian Stock Exchange in 2020
2. Tourism, hospitality and restaurant sub-sector service companies experienced losses in 2020
3. Have a complete quarterly report in 2020
4. Companies with normally distributed financial reports
Based on the sampling technique criteria above, the number of samples for this research was 20 companies. The data analysis technique used is analysis of differences using Analysis of Variance (ANOVA).

**Result**

**Descriptive Analysis**

The results of the descriptive analysis can be seen in the following table.

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Score</td>
<td>80</td>
<td>1.2794</td>
<td>1.34807</td>
<td>-3.37</td>
<td>6.92</td>
</tr>
<tr>
<td>Y-Score</td>
<td>80</td>
<td>-1.8474</td>
<td>12.03010</td>
<td>-107.00</td>
<td>2.83</td>
</tr>
<tr>
<td>X-Score</td>
<td>80</td>
<td>-1.7859</td>
<td>1.44084</td>
<td>-4.29</td>
<td>4.60</td>
</tr>
<tr>
<td>G-Score</td>
<td>80</td>
<td>0.2257</td>
<td>0.54390</td>
<td>-0.95</td>
<td>3.62</td>
</tr>
<tr>
<td>S-Score</td>
<td>80</td>
<td>0.1367</td>
<td>0.52649</td>
<td>-1.56</td>
<td>3.12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>400</td>
<td>-0.3983</td>
<td>5.57186</td>
<td>-107.00</td>
<td>6.92</td>
</tr>
</tbody>
</table>

Based on table 1 above, it can be seen that the average bankruptcy prediction analyzed using the Z-Score is 1.2794 or in the gray area category; the average bankruptcy prediction analyzed using the Y-Score is -1.8474 or in the category of not experiencing bankruptcy; the average bankruptcy prediction analyzed using the X-Score is -1.7859 or in the healthy company category; the average bankruptcy prediction analyzed using the G-Score is 0.2257 or in the gray area category; The average bankruptcy prediction analyzed using the S-Score is 0.1367 or in the unhealthy category.

**Homogeneity Analysis**

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Say.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.463</td>
<td>4</td>
<td>395</td>
<td>.002</td>
</tr>
</tbody>
</table>

Based on table 2 above, it can be seen that the significance value of 0.002 is smaller when compared to the alpha value of 0.05. Therefore, it can be concluded that the variants of the five groups are not the same.

**Analysis of Variance (ANOVA)**

The results of the analysis of variance (ANOVA) test can be seen in the following table.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>601.227</td>
<td>4</td>
<td>150.307</td>
<td>5.037</td>
<td>.001</td>
</tr>
<tr>
<td>Within Groups</td>
<td>11785.978</td>
<td>395</td>
<td>29.838</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>12387.205</td>
<td>399</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows a significance value of 0.001 and an alpha value of 0.05. The significance value is smaller when compared to the alpha value. Therefore, it can be concluded that Ho is rejected, meaning that there are differences in bankruptcy predictions for hotel, restaurant and tourism service companies based on Z-Score, Y-Score, X-Score, G-Score and S-Score analysis.

Based on the results of the analysis in table 3 above, the next analysis is the following post hoc analysis.
Based on table 4 above, it can be described as follows:

1. Differences between bankruptcy prediction models using Z-Score analysis and Y-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using Z-Score and Y-Score is 0.152. This value is greater than the alpha value of 0.05. So it can be concluded that there is no difference between the bankruptcy prediction models analyzed using the Z-Score and the Y-Score.

2. The difference between bankruptcy analysis using Z-Score analysis and X-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using Z-Score and X-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using Z-Score and X-Score.

3. The difference between bankruptcy analysis using Z-Score analysis and G-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the Z-Score and G-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using Z-Score and G-Score.

4. The difference between bankruptcy analysis using Z-Score analysis and S-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the Z-Score and S-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using Z-Score and S-Score.

5. The difference between bankruptcy analysis using Y-Score analysis and X-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the Y-Score and the X-Score is 1.000. This value is greater than the alpha value of 0.05. So it can be concluded that there is no difference between the bankruptcy prediction models analyzed using the Y-Score and the X-Score.

6. The difference between bankruptcy analysis using Y-Score analysis and G-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the Y-Score and the G-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using Z-Score and G-Score.
Score is 0.540. This value is greater than the alpha value of 0.05. So it can be concluded that there is no difference between the bankruptcy prediction models analyzed using the Y-Score and the G-Score.

7. The difference between bankruptcy analysis using Y-Score analysis and S-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the Y-Score and S-Score is 0.580. This value is greater than the alpha value of 0.05. So it can be concluded that there is no difference between the bankruptcy prediction models analyzed using the Y-Score and the S-Score.

8. The difference between bankruptcy analysis using X-Score analysis and G-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the X-Score and the G-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using the X-Score and the G-Score.

9. The difference between bankruptcy analysis using X-Score analysis and S-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the X-Score and S-Score is 0.000. This value is smaller than the alpha value of 0.05. So it can be concluded that there are differences in bankruptcy prediction models which are analyzed using the X-Score and the S-Score.

10. The difference between bankruptcy analysis using G-Score analysis and S-Score analysis in Hospitality, Restaurant and Tourism Sector Service Companies

Based on the tests in table 4, the significance value of the difference between the bankruptcy prediction model using the G-Score and S-Score is 0.831. This value is smaller than the alpha value of 0.05. So it can be concluded that there is no difference between the bankruptcy prediction models analyzed using the G-Score and the S-Score.

Discussion

Based on hypothesis testing using ANOVA, it was found that there were differences in bankruptcy prediction models for hospitality, restaurant and tourism service companies during the Covid-19 pandemic. The bankruptcy prediction models were analyzed using Z-Score and Y-Score; Y-Score with X-Score, G-Score, and X-Score; The G-Score and S-Score have an insignificant difference. Meanwhile, the bankruptcy prediction model analyzed uses Z-Score with X-Score, G-Score, and S-Score; X-Score with G-Score and S-Score have significant differences.

This research is in line with the results of research conducted by Masdiantini & Warasniasih (2020) in their research who found that the Altman Model, Springate Model, Zmijewski Model, Taffler Model, and Fulmer Model had differences in predicting company bankruptcy. Apart from that, Prakoso et al (2022) also found that there were differences in the financial ratios used and bankruptcy value criteria for each bankruptcy prediction using the Taffler, Springate and Grover models. Research by Sandra et al (2023) found that there are differences in bankruptcy prediction models which were analyzed using the Zmijewski, Ohlson, and Altman models. The Ohlson bankruptcy prediction model is the model that best maps bankruptcy. Research by Azzahro and Soemaryono (2020) found that there are significant differences between the Altman model, Springate model, Zmijewski model, and Grover model in predicting bankruptcy. Sumarna et al (2020) in their research found that the Altman Model and Zmijewski had a significant difference in predicting bankruptcy; Altman and Springate models have significant
differences in predicting bankruptcy; Altman and Grover models have significant differences in predicting bankruptcy; The Springate model with Zmijewski has a significant difference in predicting bankruptcy; The Zmijewski and Grover models have significant differences in predicting bankruptcy; and the Springate Model with Grover have significant differences in predicting bankruptcy.

In contrast to the results of research conducted by Iswahyudi (2022), there is no difference in the bankruptcy prediction model which was analyzed using X-Score, T-Score, and S-Score.

Conclusion

Based on the results of hypothesis testing, it can be concluded that in general there are differences in bankruptcy prediction models for hotel, restaurant and tourism service companies in Indonesia, especially during the Covid-19 pandemic. However, individually several prediction models have similarities, such as the Z-Score model and the Y-Score, Y-Score model with X-Score, G-Score, and S-Score models, and G-Score model with S-Score model. The results of this research can be a reference for service companies, especially the hotel, restaurant and tourism sectors, so they can choose the right prediction model. So it can predict bankruptcy earlier.

References


