International Journal of Public Finance
E-ISSN: 2548-0499 DOI: 10.30927/ijpf.1329185
2023 | Vol. 8 No. 2 | pp. 251 – 268
homepage: https://dergipark.org.tr/tr/pub/ijpf

Financial Distress of BIST Tourism Businesses During Covid-19

Ömer Burak Paksoy[1]
Osman Nuri Şahin[2]

RESEARCH ARTICLE
Araştırma Makalesi

ARTICLE INFO

Submitted : 18.07.2023
Revised : 03.11.2023
Accepted : 19.11.2023
Available : 30.12.2023

iThenticate similarity score: 16%

JEL classification:
G10, G30, M20

Keywords:
Covid-19, Financial Risk, Altman Z-Score, Springate S-Score, Financial Distress

A B S T R A C T

This study aims to examine the financial effects of Covid-19 on tourism businesses in Turkey within the scope of financial distress. For this purpose, Altman Z-Score, and Springate S-Score were used. The sample of the study consists of 8 tourism companies traded in Borsa Istanbul (BIST) between the years 2019-2021 when Covid-19 is in question. According to the results of the analysis, Altman Z-Score and Springate S-Score models indicate similar results for the tourism companies included in the analysis. According to the Altman Z-Score model, before the Covid-19 period, in 2019, 2 companies were in the risky region in terms of financial distress; in 2020, which is the Covid-19 period, 1 company is risky and 1 company is in an uncertain area; in 2021, the period after the Covid-19, we saw that 2 companies are located in the risky area. According to the Springate S-Score model, it has been determined that 4 companies in 2019, 5 companies in 2020, and 4 companies in 2021 are located in the risky area. While we expect that the negative situations caused by the Covid-19 pandemic will negatively affect tourism businesses financially, the findings obtained in the study do not support this expectation much.

Citation: Paksoy, Ö.B. & Şahin, O.N. (2023). "Financial Distress of BIST Tourism Businesses During Covid-19". *International Journal of Public Finance*. 8(2), 251 – 268. https://doi.org/10.30927/ijpf.1275686

[1] Assist. Prof. Ph.D., Alanya Alaaddin Keykubat University, Türkiye, ORCID: https://orcid.org/0000-0002-1273-5915, omer.paksoy@alanya.edu.tr
[2] Assoc. Prof. Ph.D., Alanya Alaaddin Keykubat University, Türkiye, ORCID: https://orcid.org/0000-0002-6586-7073, osmannurisahin@yahoo.com

1. Introduction

Tourism is one of the sectors most affected by the Covid-19 pandemic. The huge decrease in the number of foreign tourists, together with the reduction in bans and restrictions, cancellations, and reservations, has put a great deal of pressure on the tourism sector. In addition, the decline was mainly due to the reluctance of citizens to travel, concerns about the impact of Covid-19, and the slowdown in domestic travel. This situation has seriously affected businesses operating in the tourism and travel sector and disrupted employment opportunities. The Covid-19 outbreak caused great financial uncertainty in all world stock markets, and the first drop in March 2020 was followed by unexpected rapid growth in 2021. Therefore, the estimation of financial risk remains an important topic in financial planning handling new uncertainties.

This study aims to examine the effects of Covid-19 on the risks of financial distress of tourism businesses in Turkey. For this purpose, two bankruptcy risk prediction analysis models, Altman Z-Score, and Springate S-Score were used. The sample of the study consists of 8 tourism companies traded in Borsa Istanbul (BIST) between the years 2019-2021. In the study, the literature on national and international studies on financial distress models was reviewed. In the methodology, the data set and prediction models used are specified. Then, the application part of the evaluation of whether companies have experienced financial difficulties between 2019-2021 is included. The results were stated and some suggestions were made regarding the studies that could be done in the future

2. Literature Review

Financial reporting and future period forecasts are of vital importance for businesses. Therefore, the developed bankruptcy risk or financial success estimation models are considered as important financial tools to take precautionary measures to avoid a negative situation. The financial performance concept, which entered the finance literature in the 1960s, has become widespread since the 1970s and has begun to be considered in all sectors. When an individual or company is in financial distress, it means that they are unable to satisfy their financial responsibilities because they are either unable to create enough money or any income at all. High fixed costs, primarily illiquid assets, or income that is vulnerable to economic downturns are frequently to blame for this. It can be disastrous to ignore warning signs of financial difficulty before they get out of hand. If the company's or person's responsibilities have gotten too big and can't be paid back, there may come a point where substantial financial suffering can no longer be relieved, and if that happens bankruptcy may be the only alternative. Tourism is one of the sectors in the most difficult situation during the Covid-19 pandemic period. One of the most important problems of tourism companies in Turkey is that their financial structures are generally weak. This weakness in their financial structures causes

businesses in the sector to be affected very quickly in case of any crisis or economic fluctuation in the country.

The first study on estimating financial distress or bankruptcy risk using financial ratios was done by Beaver (1966) using the univariate analysis model. Based on this model, multivariate analysis models were developed in the following years. In the literature, it is seen that the models developed by Altman (1968), Springate (1978), Ohlson (1980), Zmijewski (1984), and Fulmer (1984) are frequently used in various studies using financial distress or bankruptcy risk prediction models. It is seen that these models are preferred because of their high prediction success rates, and also these models are used together with systems such as logistic regression analysis, neural networks, artificial intelligence, decision tree, and linear probability models.

When literature is examined, there are various studies to predict the financial distress, financial failure, or bankruptcy risk of enterprises. Within the scope of the study, some studies are summarized below.

Wulandari (2021) determined the companies located in risky zone during Covid-19. Tekin and Gör (2022) used Altman Z-Score and Springate S- Score models and found that the risk of the financial failure of banks is quite low. Hau and Oanh (2021) determined the companies those are in the risky zone during Covid-19. Şahin and Özkan (2022) used Altman Z- Score, Springate S- Score, Taffler T- Score, and Zmijewski X- Score models and Covid-19 didn't affect automotive companies in terms of financial failure. There are various studies on different sectors that used Altman Z-Score and/or Springate S- Score on companies and found companies in risky zone(Prasetiyani and Sofyan, 2020; Gümüş and Altıok, 2020; Aksu, 2019; Affandi and Meutia, 2021; Gezen and Özcan, 2022; Maharani and Sari, 2021; Fidan, 2021; Kablan, 2020, Gülençer and Hazar, 2020). Other studies that used different models like Fulmer H- Score, Canada CA- Score, Ohlson O-Score, Beneish M- Score etc. to analyze companies' financial distress and/or risk also exists(Akyüz, 2020; Maulidya and Filianti, 2020; Karadeniz and Öcek, 2020; Öztürk and Yılmaz, 2019).

3. Theoretical Background

3.1. Altman Z-Score Model

The Z-score approach, created in 1968 as an indicator of a company's financial health, is the most popular financial crisis forecasting tool. It was invented by American finance professor Edward Altman. In his study of bankruptcy filings by American businesses between 1946 and 1965, Altman (1968) focused on this period. Failure has been quite well predicted by Altman's financial distress forecasting model. The model was updated and used in several industries in succeeding eras. Altman developed new models in 1993 and 2000. The most recently developed model typically has significantly better results in estimating the risk of bankruptcy of retail and service firms than manufacturing firms (Kiracı, 2021).

A mathematical measurement technique called Altman's Z-score is used to forecast the likelihood that a company would fail during the following two years. The model was developed as a discriminant analysis tool that includes five financial ratios and is used to determine the bankruptcy risk of the company. Although the Altman Z-score model was developed to determine the probability of bankruptcy of businesses, it is also thought to be a model that can help businesses evaluate their financial distress and lenders in their investment decisions. In the Altman model, 5 financial ratios representing 22 financial ratios were defined, and the financial variables are proportional. A positive linear function is obtained by multiplying these ratios by some coefficients. These rates are; liquidity, profitability, leverage, solvency, and operating ratio (Elmas, 2019; Türk and Kürklü, 2017). The first model (1) developed in 1968 is as follows:

$$Z\ Skor = 0{,}012X_1 + 0{,}014X_2 + 0{,}033X_3 + 0{,}006X_4 + 0{,}999X_5 \qquad (1)$$

X_1: Working Capital / Total Assets

X_2: Retained Profits / Total Assets

X_3: Earnings Before Interest and Taxes / Total Assets

X_4: Market Value of Equity / Book Value of Total Debt

X_5: Sales / Total Assets

Working Capital / Total Assets: Working capital represents the funds available for the day-to-day operations of a business, calculated as the difference between current assets and current liabilities. This ratio provides insights into how efficiently a company is using its assets to support its day-to-day operations. A higher ratio indicates that a larger portion of the company's total assets is devoted to working capital, suggesting better short-term liquidity and ability to cover short-term obligations. Conversely, a lower ratio might indicate a potential liquidity issue or inefficient use of assets to support short-term operations.

Retained Profits / Total Assets: The ratio of retained profits (or retained earnings) to total assets is a financial metric that assesses the proportion of a company's retained earnings in relation to its total assets. Retained earnings represent the accumulated profits of a company that have not been distributed to shareholders in the form of dividends but have been reinvested back into the business. This ratio provides insights into the extent to which a company's total assets are financed by internally generated funds (retained profits). A higher ratio suggests that a significant portion of the company's assets is funded by retained earnings, indicating financial stability and the ability to reinvest profits into the business for growth and expansion.

Earnings Before Interest and Taxes / Total Assets: The ratio of Earnings Before Interest and Taxes (EBIT) to Total Assets is a financial metric that measures a company's ability to generate earnings in relation to its total assets. EBIT represents the company's earnings before deducting interest expenses and taxes. It's a fundamental indicator of a

company's operational profitability, excluding the impact of financial and tax factors. This ratio provides insights into how efficiently a company generates earnings from its assets. A higher ratio indicates that the company is effectively utilizing its assets to generate earnings, signaling operational efficiency. A lower ratio might indicate that the company is less efficient in generating earnings from its assets.

Market Value of Equity / Book Value of Total Debt: The ratio of Market Value of Equity to Book Value of Total Debt compares the market value of a company's equity to the book value of its total debt. This comparison provides insights into the relationship between the market's perception of a company's equity and the accounting value of its total debt. This ratio helps investors and analysts understand how the market values a company's equity in comparison to the book value of its total debt. A ratio greater than 1 might indicate that the market perceives the company's equity more favorably compared to the book value of its debt, potentially signaling that the company's equity is relatively stronger or more highly valued by investors. Conversely, a ratio less than 1 could suggest that the market values the company's equity less than the book value of its debt, which might imply concerns or a more conservative view on the company's equity in relation to its debt.

Sales / Total Assets: The ratio of Sales to Total Assets measures a company's ability to generate sales revenue relative to the total assets it possesses. It assesses the efficiency of asset utilization in generating sales or revenue. This ratio provides insights into how effectively a company is utilizing its assets to generate sales. A higher ratio indicates that the company is generating a substantial amount of sales in relation to its total assets, suggesting efficient asset utilization and potentially higher productivity. Conversely, a lower ratio might indicate that the company is less effective in generating sales relative to its asset base. It could imply either underutilization of assets or a need for higher investment to leverage the existing assets for increased sales generation.

Altman received criticism that the expected successful results for private companies could not be achieved in the first model he developed. Thus, it has developed two more models by making updates to this model. He created the Z' model for businesses in the private sector as well as the Z'' model for non-manufacturing and service-based businesses, and the new models are shown in equations (2) and (3), respectively (Altman, 2000; Yıldız, 2014).

$$Z' \text{ Skor} = 0.717X_1 + 0.847X_2 + 3.107X_3 + 0.42X_4 + 0.998X_5 \quad (2)$$

$$Z'' \text{ Skor} = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (3)$$

In the last model developed in 2000, the 5th variable was removed from the equation and the effect of the manufacturing sector was reduced. Thus, since the coefficients in the model have changed, the Z-score discriminant intervals have also changed as shown in Table 1.

Table 1. Altman Z-Score Model Discriminant Ranges

"Z-Score Ranges for Publicly Traded Manufacturing Companies (Altman, 1968)"	**"Z' Score Ranges for Private Sector Manufacturing Companies (Altman, 2000)"**	**"Z'' Score Ranges for Private Sector Service Companies (Altman, 2000)"**
"Safe (green) zone if Z score > 2.99"	"Safe (green) zone if Z's score > 2.90"	"Safe (green) zone if Z'' score > 2.60"
"Gray (indeterminate) region if 1.81 < Z score < 2.99"	"Gray (indeterminate) region if 1.23 < Z' score < 2.99"	"Gray (indeterminate) region if 1.1 < Z" score < 2.60"
"If Z-score < 1.8, the risky (red) region"	"If Z's score < 1.23, the risky (red) region"	"If the Z'' score is < 1.1, the risky (red) region"

Source: Yıldız, 2014.

3.2. Springate S-Score Model

Gordon Springate created the Springate S-score model in 1978. According to the multiple discriminant analysis approach, this model forecasts bankruptcy. The financial characteristics are divided to get the Springate S-score. The final S-score is calculated by multiplying the outcome of the financial ratios by a set of coefficients (Kiracı, 2021; Springate, 1978). According to Springate (1978), this model, which he created to forecast the financial failure of 40 industrial enterprises doing business in Canada, has a 92.5% accuracy rate (Şahin and Özkan, 2022).

Springate used four baseline ratios in his model to predict an S-value for successful and unsuccessful businesses. The prediction model is as follows:

$$S\text{-}Score = 1{,}03Y_1 + 3{,}07Y_2 + 0{,}66Y_3 + 0{,}4Y_4 \quad (4)$$

Y_1: Working Capital / Total Assets

Y_2: Earnings Before Tax and Interest / Total Assets

Y_3: Profit Before Tax and Interest / Short-Term Liabilities

Y_4: Total Sales / Total Assets

The company has been determined to be at a high risk of bankruptcy if its S-score is below 0.862, and it is in the safe (green) zone if it is above 0.862.

Profit Before Tax and Interest / Short-Term Liabilities: The ratio of Profit Before Tax and Interest to Short-Term Liabilities measures a company's ability to cover its short-

term liabilities with its earnings before taxes and interest expenses. This ratio helps in evaluating the company's ability to meet its short-term financial obligations with its earnings before considering interest payments and taxes. A higher ratio suggests the company's ability to cover its short-term liabilities with its operating profits, indicating a stronger ability to manage short-term obligations. Conversely, a lower ratio might indicate potential difficulties in covering short-term liabilities solely with its operational profits, suggesting a need for other sources of liquidity or more efficient management of short-term obligations.

4. Methodology

In this section, the study's data set included and the prediction models used is given. This study aims to examine the effects of worldwide restrictions and prohibitions on the financial distress or bankruptcy risks of tourism businesses operating in Turkey throughout the Covid-19 pandemic. For this purpose, Altman Z-score and Springate S-score ratios were calculated for each company by using the financial data of 8 companies. The new model developed by Altman for private sector manufacturing and service companies in 2000 will be used when calculating the Z-scores. Another method used in the study is Gordon L.V. It is the Springate S-score model, which is a model developed by Springate that uses multivariate discriminant analysis just like the Altman Z-score model.

Altman Z-score and Springate S-score methods were used in the study to examine whether the tourism businesses listed on the BIST experienced financial difficulties before the Covid-19 pandemic, during the pandemic period, and after the pandemic. For this purpose, BIST Tourism Index businesses operating in Turkey constitute the scope of the study. The research sample consists of 8 tourism enterprises that constantly offer their financial data to the public, offer hotel and accommodation services, and prepare their financial statements in a consolidated manner between the 2019-2021 periods.

The data of the businesses in the tourism and lodging sectors were used in this study, whose shares are exchanged on the BIST exchange in Borsa Istanbul. Altman Z-score and Springate S-score methods were used by using various financial indicators and ratios to evaluate the financial difficulties of businesses in the pre and post-Covid period. The financial indicators of the companies subject to the analysis were calculated every year using the financial position and profit/loss statement data obtained from the Public Disclosure Platform (KAP) website. The businesses' trademarks that are the subject of the research and their transaction codes in BIST are shown in Table 2.

Table 2. Commercial Titles of Enterprises and BIST Codes

BIST Transaction Code	Commercial title
"AVTUR"	"Avrasya Petrol ve Turistik Tesisler Yatırımlar A.Ş."
"AYCES"	"Altın Yunus Çeşme Turistik Tesisler A.Ş."
"MAALT"	"Marmaris Altınyunus Turistik Tesisler A.Ş."
"MARTI"	"Martı Otel İşletmeleri A.Ş."
"PKENT"	"Petrokent Turim A.Ş."
"TEKTU"	"Tek-Art İnşaat Ticaret Turizm Sanayi ve Yatırımlar A.Ş."
"ULAS"	"Ulaşlar Turizm Yatırımları ve Dayanıklı Tüketim Malları Ticaret Pazarlama A.Ş."
"MERIT"	"Merit Turizm Yatırım ve İşletme A.Ş."

In Turkey, there are numerous businesses engaged in the tourism industry. However, since the financial data of non-public companies could not be accessed, companies that produce goods/services in their fields of activity other than the tourism sector were not included in the analysis. The research's set of data consists of quantitative data from tourism and accommodation companies that are traded in BIST and whose balance sheets are consolidated. The scope of the analysis covered 8 businesses, and financial reports for the 2019–2021 months were used.

The study's focus is on the companies' financial statistics subject to the analysis before the pandemic and during the pandemic period were examined with the assistance of Z-score and S-score models, and it was analyzed whether there were bankruptcy risks in the tourism sector in the new conditions created by the pandemic. In this context, financial data reported to the Public Disclosure Platform (KAP) by the relevant businesses in 2019, 2020, and 2021 were used. The ratios calculated with the said data and included in the models are given in Table 3.

Table 3. Year-Based Indicator Ratios of Businesses

Year	Company	X_1	X_2	X_3	X_4	Y_1	Y_2	Y_3	Y_4
2019	AVTUR	0,0660	0,1807	0,0065	6,9281	0,8867	0,0065	0,1504	0,0504
	AYCES	-0,0149	-0,0618	0,0455	4,3468	0,7963	0,0455	1,4237	0,1682
	MAALT	0,7366	0,0572	0,0066	5,0999	0,5344	0,0066	0,1298	0,0296
	MARTI	-0,8269	-0,3538	0,0314	0,0599	0,0505	0,0314	0,0338	0,1239
	PKENT	0,1028	0,1215	0,4556	5,6707	0,6244	0,4556	1,5750	1,6007
	TEKTU	-0,0307	-0,0173	0,0132	1,0087	0,7054	0,0132	0,1205	0,0378
	ULAS	0,3732	-0,1903	-0,0614	4,2886	0,8202	-0,0614	-0,5594	0,0000
	MERIT	0,1957	0,3148	0,1359	10,2824	0,9049	0,1359	2,1366	0,2825

2020	AVTUR	0,0956	0,2476	0,0118	12,8043	0,8942	0,0118	0,6224	0,0295
	AYCES	-0,0336	-0,0383	0,0039	20,9950	0,7824	0,0039	0,0913	0,0805
	MAALT	0,6319	0,1503	0,0064	8,6517	0,5968	0,0064	0,1582	0,0280
	MARTI	-0,7284	-0,3487	0,0102	0,1991	0,0965	0,0102	0,0122	0,0419
	PKENT	0,0691	0,3267	-0,0225	38,0570	0,6084	-0,0225	-0,0739	0,5587
	TEKTU	-0,0029	-0,0507	0,0044	1,2960	0,6435	0,0044	0,0479	0,0159
	ULAS	0,2606	-0,0258	-0,0573	24,4209	0,8759	-0,0573	-1,2090	0,0000
	MERIT	0,2527	0,4609	0,0305	63,9172	0,9336	0,0305	0,9535	0,0959
2021	AVTUR	0,0745	0,2046	0,0077	8,2427	0,9013	0,0077	0,5426	0,0249
	AYCES	0,0036	-0,0253	0,0400	14,7639	0,8340	0,0400	1,3148	0,0964
	MAALT	0,6296	0,1929	0,0062	20,5392	0,6665	0,0062	0,0973	0,0218
	MARTI	-0,0941	-0,1234	0,0057	0,1292	0,3416	0,0057	0,0422	0,0412
	PKENT	0,2077	0,1218	0,2408	192,7226	0,7548	0,2408	1,3144	0,6802
	TEKTU	-0,0647	-0,0623	0,0058	0,4746	0,5959	0,0058	0,0507	0,0209
	ULAS	0,2205	-0,0884	-0,0249	4,0568	0,7502	-0,0249	-0,5801	0,0000
	MERIT	0,0033	0,0268	0,0051	21,2257	0,9577	0,0051	1,0149	0,0119

The financial ratios in Table 3 constitute the input data of the methods used in the research. Then, the bankruptcy risks of the enterprises were calculated using the Altman Z-score and Springate S-score methods by considering the data in question every year.

5. Findings

Within the scope of the study, primarily Altman Z-score and Springate S-score ratios were determined. In this context, first of all, calculations were made by placing the data on the account ratios into the relevant equations as per the process steps of the methods. As a result of these calculations, the Z-score and S-scores of the enterprises for the 2019-2021 periods are shown in the Table 4.

Table 4. Z-Scores and S-Scores for the 2019-2021 Periods

Year	Company	Z- Score	S- Score
2019	AVTUR	8,3398	1,0527
	AYCES	4,5708	1,9668
	MAALT	10,4178	**0,6681**
	MARTI	**-6,3042**	**0,2203**
	PKENT	10,0864	3,7217
	TEKTU	**0,8902**	**0,8617**
	ULAS	5,9181	**0,2871**
	MERIT	14,0202	2,8725

2020	AVTUR	14,9584	1,3800
	AYCES	21,7256	0,9102
	MAALT	13,7624	0,7499
	MARTI	-5,6372	0,1555
	PKENT	41,3271	0,7323
	TEKTU	1,2065	0,7144
	ULAS	26,8822	-0,0716
	MERIT	70,4785	1,7230
2021	AVTUR	9,8624	1,3201
	AYCES	15,7122	1,8883
	MAALT	26,3665	0,7784
	MARTI	-0,8458	0,4136
	PKENT	205,7364	2,6563
	TEKTU	-0,0899	0,6734
	ULAS	5,2500	0,3132
	MERIT	22,4304	1,6769

Table 4 indicates the Z-scores and S-scores calculated to determine the bankruptcy risks of the analyzed businesses in the 2019-2021 periods. The ratios indicated in green indicate that the enterprise is in the safe zone, those that are indicated in gray indicate that the enterprise is in an uncertain situation, and those that are indicated in red indicate that the enterprise is located in the risky zone. The data obtained on a business basis over the years are summarized in the tables 5.

Table 5. AVTUR Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	8,3398	1,0527
2020	14,9584	1,3800
2021	9,8624	1,3201

In Table 5, Avrasya Petrol ve Turistik Tesisler Yatırımlar A.Ş. (AVTUR) company Z-score and S-score ratios are demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 8.3398, 14.9584, and 9.8624, respectively. In addition, the S-scores of the enterprise for the relevant periods were calculated as 1.0527, 1.3800, and 1.3201, respectively, and according to both methods, it can be observed that the business does not always pose a risk of financial difficulties or insolvency.

Table 6. AYCES Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	4,5708	1,9668
2020	21,7256	0,9102
2021	15,7122	1,8883

In Table 6 Altın Yunus Çeşme Turistik Tesisler A.Ş. (AYCES) enterprise Z-score and S-score ratios are demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 4.5708, 21.7256, and 15.7122, respectively. In addition, the S-scores of the enterprise for the relevant periods were calculated as 1.9668, 0.9102, and 1.8883, respectively, and according to both methods, it can be verified that the company is not consistently in a dangerous category in terms of its vulnerability to financial trouble or insolvency.

Table 7. MAALT Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**10,4178**	**0,6681**
2020	**13,7624**	**0,7499**
2021	**26,3665**	**0,7784**

Table 7 indicates Marmaris Altın Yunus Turistik Tesisler A.Ş. The Z-score and S-score ratios for the (MAALT) business were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 10.4178, 13.7624, and 26.3665, respectively. According to the Z-score ratios, it is seen that the enterprise is not in the risky range and there is no risk of bankruptcy. However, when the S-scores of the enterprise for the same periods are analyzed, they are calculated as 0.6681, 0.7499, and 0.7784, respectively, therefore it can be observed that the company is in a dangerous area in terms of the likelihood of financial trouble or insolvency.

Table 8. MARTI Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**-6,3042**	**0,2203**
2020	**-5,6372**	**0,1555**
2021	**-0,8458**	**0,4136**

In Table 8, Martı Otel İşletmeleri A.Ş. The Z-score and S-score ratios for the (MARTI) business were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as -6.3042, -5.6372, and -0.8458, respectively. In addition, the S-scores of the enterprise for the relevant periods are calculated as 0.2203, 0.155, and 0.4136, respectively, and according to both methods, it can be seen that the company always poses a risk of experiencing financial difficulty or bankruptcy.

Table 9. PKENT Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**10,0864**	**3,7217**
2020	**41,3271**	**0,7323**
2021	**205,7364**	**2,6563**

In Table 9, Petrokent Turizm A.Ş. The Z-score and S-score ratios for the (PKENT) business were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 10.0864, 41.3271, and 205.7364, respectively. In addition, the S-scores of the enterprise for the relevant periods were calculated as 3.7217, 0.7323, and 2.6563, respectively. The Z-score approach reveals that the firm is not consistently in the risky area in terms of its vulnerability to financial difficulty or insolvency. According to the S-score method, it is observed that it is in the bankruptcy risk zone in terms of financial distress only in 2020 (The covid-19 pandemic period). In other periods, it is located in a safe zone.

Table 10. TEKTU Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**0,8902**	**0,8617**
2020	**1,2065**	**0,7144**
2021	**-0,0899**	**0,6734**

In Table 10, Tek-Art Construction Trade Tourism Industry and Investments Inc. (TEKTU) enterprise Z-score and S-score ratios were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 0.8902, 1.2065, and -0.0899, respectively. In addition, the S-scores of the enterprise for the relevant periods were calculated as 0.8617, 0.7144, and 0.6734, respectively. The Z-score technique reveals that the company, which is in the gray (uncertain) region in 2020, is in the dangerous range in terms of the likelihood of experiencing financial trouble or insolvency in future periods according to both methods.

Table 11. ULAS Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**5,9181**	**0,2871**
2020	**26,8822**	**-0,0716**
2021	**5,2500**	**0,3132**

In Table 11, Ulaşlar Turizm Yatirimlar ve Durable Tüketim Malları Ticaret Pazarlama A.Ş. The Z-score and S-score ratios for the (ULAS) business were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 5.9181, 26.8822, and 5.2500, respectively. According to the Z-score ratios, it is seen that the enterprise is not in the risky range and there is no risk of bankruptcy. However, when the S-scores of the enterprise for the same periods are analyzed, they are calculated as 0.2871, -0.0716, and 0.3132, respectively, therefore it can be observed that the company is in a dangerous area in terms of the likelihood of financial trouble or insolvency.

Table 12. MERIT Z-Scores and S-Scores

Year	Z- Score	S- Score
2019	**14,0202**	**2,8725**
2020	**70,4785**	**1,7230**
2021	**22,4304**	**1,6769**

Table 12 shows Merit Turizm Yatırım ve İşletme A.Ş. The Z-score and S-score ratios for the (MERIT) business were demonstrated. The business's Z-scores for the years 2019-2021 were calculated as 14.0202, 70.4785, and 22.4304, respectively. In addition, the S-scores of the enterprise for the relevant periods are calculated as 2.8725, 1.7230, and 1.6769, respectively, and according to both methods, it can be observed that the business does not always pose a risk of financial difficulties or insolvency.

6. Conclusion and Discussion

Since the beginning of 2020 in Turkey, Covid-19 pandemic measures have been taken and many restrictions have been introduced. Especially, companies in the tourism sector ceased their activities completely and took one of the heaviest blows during the Covid-19 pandemic period. In order to ascertain whether Turkish tourism businesses, which are believed to be impacted by the Covid-19 epidemic, are having financial issues, Altman and Springate forecasting models were used for companies in the BIST Tourism Index. In the study, the financial data of the companies in the BIST Tourism Index for the years 2019, 2020, and 2021 were used to indicate the effects of the Covid-19 pandemic. 2019 was considered the pre-pandemic period, 2020 was the pandemic and 2021 was the post-pandemic period. As a result of the analyzes conducted; According to the Altman Z-Score method, it is seen that 2 companies are in the financially risky region in 2019, 1 company in the risky and 1 company in the uncertain region in 2020, and 2 companies in the risky region in 2021. According to the Springate S-Score method, 4 companies in 2019, 5 companies in 2020, and 4 companies in 2021 are in the risk zone. Other companies are located in the safe, that is, risk-free zone.

When the study's findings are examined on a company-by-company basis, it becomes clear that MARTI and TEKTU are in the financially dangerous region for both models and all examined time periods. According to the information obtained from the footnotes of the 2021 financial report of MARTI, the company signed a debt restructuring agreement with a bank and factoring company due to financial difficulties. Similarly, the TEKTU enterprise was located in the uncertain region only in 2020 and is in the risky region in other periods. Other companies, which are subject to analysis according to the Altman Z-score method, are in the safe zone in all periods. Although MAALT and ULAS companies are in the safe zone in Altman's Z-score method, they are classified in the risky zone according to the Springate S-score method. Similarly, PKENT company was included in the risk zone only in 2020 according to the Springate S-score

method. According to the Springate method, other companies are located in the safe zone. The analyzes made with the models developed by Altman and Springate have different criteria. While performing a bankruptcy risk analysis of a company in the Altman Z-score method, a triple classification is made as green, gray, and red areas, while a dual classification is made as safe and risky in the Springate S-score method. Different analytical methods are applied in the two models and different discriminant coefficients are based on similar or the same variables. The differing results between the Altman Z-Score and Springate S-Score models stem from variations in the choice of financial ratios, the weightings assigned to these ratios, interpretation of scores, and the contexts in which the models were developed. These differences emphasize different aspects of a company's financial health and can lead to varying predictions regarding the risk of financial distress or bankruptcy. Understanding these nuances is crucial in effectively utilizing these models for financial analysis and risk assessment. Altman's Z-Score employs ratios that encompass various aspects of a company's financial health, such as profitability, leverage, liquidity, solvency, and activity. In contrast, the Springate S-Score employs ratios, focusing on different aspects like solvency, efficiency, and market valuation. Differences in the specific ratios used mean that each model emphasizes certain financial characteristics more than others. For instance, Altman's Z-Score includes the market value of equity to book value of total liabilities, which might have a different impact compared to the ratios used in the Springate S-Score model. The weightings assigned to each ratio in the formulas are crucial in determining the final score. The Z-Score has a simpler formula with fixed weightings for each ratio. In contrast, the Springate S-Score uses a more complex formula with varied weightings for different ratios. The allocation of weightings is based on the developer's analysis and could reflect varying perspectives on which financial ratios are more indicative of financial distress.

Since 2020 is the year in which Covid-19 restrictions and bans were introduced, the expectation of businesses to have financial difficulties is very high compared to the pre-pandemic period. In addition, a great decrease is observed in the number of tourists and tourism revenues coming to Turkey in 2020. However, looking at the results of the analysis, it can be said that the tourism companies that were the subject of the research during the pandemic period were not affected by the crisis financially. One of the reasons for this is the increase in the market values of the related companies. Due to the Covid-19 crisis, most of the investments in the market have shifted to stock markets rather than real markets. This situation caused the shares of the companies to be traded on the stock exchanges in high volume and an increase in the market values of the companies. In addition to the fact that there are many reasons why the companies subject to the analysis do not fall into financial distress in the relevant periods, the most important reason is that the market values of the companies have a significant share in the estimation of the bankruptcy risk in the models applied in the study. In addition, many government supports such as loan facilities, short-time working allowances, tax reductions, and social security incentives were provided to businesses by the state during the Covid-19 period in Turkey. These regulations may also have ensured that

tourism businesses do not fall into financial difficulties during the pandemic period. Also companies that had diversified their offerings might have been less affected. For instance, those offering a combination of services like accommodation, travel packages, and online experiences were better equipped to withstand the limitations imposed by the pandemic. Businesses that primarily catered to domestic tourism might not have been as affected, especially if local travel restrictions were less stringent compared to international travel. Businesses that swiftly pivoted their business models, such as offering flexible cancellation policies, restructuring packages to align with travel restrictions, or adopting safety measures, were more likely to retain customers and maintain revenue streams. Companies that effectively managed their costs, including reducing operational expenses and renegotiating contracts, were able to navigate the financial impact more effectively. Some companies might have had forward contracts or insurance in place to protect them from sudden financial shocks due to disruptions like a pandemic.

Two distinct estimating methods were used in the study to compare how the Covid-19 epidemic affected the financial health of tourism enterprises. This study's findings are consistent with those of other research on the topic in the literature. Only the Altman Z-score model was employed in other studies to estimate the effects of the Covid-19 period and the level of financial crisis in the Turkish tourism industry, and there were relatively few studies using both models. It is anticipated that this study will add to the body of literature by comparing the effects of Covid-19 on the tourism industry using two distinct financial models. Future research will be able to compare the outcomes of applying various estimating models or statistical methods to determine the financial distress levels of businesses in various industries. In addition, to better understand the effects of the Covid-19 crisis, the scope can be expanded by including a few more periods before and after the pandemic in the analysis. Limitations of this study include insufficient discussion of external factors. The study would benefit from a longer-term analysis, clarification of financial distress metrics, a more comprehensive consideration of external factors, and a deeper dive into the reasons for the different results between the two models. The widespread use of such studies, in which financial distress forecasting models are frequently used, can ensure that risk situations are predicted for businesses and different sectors and that necessary measures are taken in advance and investment decisions are implemented more healthily. Post-pandemic recovery in the tourism sector will require a multifaceted approach involving both tourism businesses and policymakers. The collaboration and synergy between businesses and policymakers will be crucial in the recovery and sustained growth of the tourism industry post-pandemic. Adjusting to new norms, emphasizing safety, and embracing innovation will be key factors in ensuring the sector's resurgence. Embracing digital transformation, investing in online platforms, digital marketing, and virtual experiences to cater to changing customer preferences and ensuring a seamless online presence, maintaining flexible booking and cancellation policies to adapt to uncertain times, implementing and communicating stringent health and safety protocols to

reassure travelers, diversifying offerings and tapping into niche markets or unique experiences to attract different customer segments, forging partnerships with local businesses, tour operators, and government agencies to create attractive packages, promote regional attractions, and boosting the local economy, training staff in health protocols and customer service and ensuring their well-being, and embracing sustainable tourism practices to attract environmentally conscious travelers could be some practical recommendations for tourism businesses. Also policymakers can provide financial support, grants, and incentives to encourage businesses to invest in safety measures, digital transformation, and sustainability, invest in infrastructure development, including transportation, internet connectivity, and utilities, to improve accessibility to tourist destinations, develop and communicate clear health guidelines and protocols for the tourism sector, ensure consistency and transparency to regain traveler confidence, consider flexible regulatory measures to support the recovery of the tourism sector, including simplified visa procedures, temporary tax breaks, or business-friendly policies, and invest in research and data analysis to understand evolving travel patterns, preferences, and market trends to make informed policy decisions.

Ethics Committee Approval: It is not a study that requires an ethics committee document.

Peer Review: External independent.

Author Contributions:

Ömer Burak Paksoy - Idea, Purpose, Planning and Design, Literature and Citation, Method, Data Collection, Data Analysis and Discussion, Writing and Format, Final Approval and Responsibility, Overall Contribution - 50%.

Osman Nuri Şahin - Idea, Purpose, Planning and Design, Literature and Citation, Method, Data Collection, Data Analysis and Discussion, Writing and Format, Final Approval and Responsibility, Overall Contribution - 50%.

Conflict of Interest: The authors declared no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

References

Affandi, M. R. and Meutia, R. (2021). Analisis Potensi Financial Distress Dengan Menggunakan Altman Z Score Pada Perusahan Penerbangan (Dampak Pandemı COVID-19 Dengan Penutupan Objek Wısata Dan Psbb*). J-MIND (Jurnal Manajemen Indonesia)*, 6(1), 52–63.

Aksu, M. (2019). Türkiye'de enerji şirketlerinde finansal sıkıntının belirleyicileri. ICOAEF VI International Conference on Applied Economics and Finance Extended With Social Sciences. November 16-17, 2019, Burhaniye, Balıkesir.

Akyüz, F. (2020). Taş Ve Toprağa Dayalı Sektörde Faaliyet Gösteren Şirketlerin Finansal Başarısızlık Risklerinin Tahmin Edilmesi. *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 13(1), 40–51.

Altman, E. I. (1968). Financial Ratios Discriminant Analysis and The Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4), 589–609.

Altman, E.I. (2000). Predicting financial distress of companies: revisiting the z-score and zeta models. http://people.stern.nyu.edu/ealtman/Zscores.pdf, 10.02.2021.

Beaver, W. H. (1966). Financial Ratios As Predictors of Failure. *Journal of Accounting Research*, 71–111.

Elmas, B. (2019). *Finansal Tablolar Analizi: TMS/TFRS'ye Göre Kaleme Alınmış Piyasadan Gerçek Örnekler Üzerinden Analizler*, (4. Baskı), Nobel Yayıncılık, Ankara.

Fidan, M. E. (2021). BİST'te İşlem Gören Tekstil, Giyim Eşyası ve Deri Sektörü İşletmelerinin Altman-Z Skor Yöntemi İle Finansal Başarısızlık Tahmini. *İşletme Araştırmaları Dergisi*, 13(3), 1945–1969.

Fulmer, J. G., Moon, J. E., Gavin, T. A., and Erwin, J. M. (1984). A bankruptcy classification model for small firms. *Journal of Commercial Bank Lending*, 66(11), 25–37.

Gezen, A. and Özcan, S. (2022). COVID-19'un Finansal Sıkıntı Üzerine Etkisi: Bist Turizm Endeksi Uygulaması. *İşletme Araştırmaları Dergisi*, 14(1), 483–496.

Gülençer, S. and Hazar, A. (2020). Borsa İstanbul Teknoloji Endeksi (XUTEK) Şirketlerinin Altman Z-Skor Analizi ile Değerlendirilmesi. *ISPEC Journal of Social Sciences & Humanities*, 4(2), 59–76.

Gümüş, U. T., ve Altıok, E. (2020). *Türkiye Ekonomisi İşletme, İktisat ve Muhasebe Açısından Konjonktürel Değerlendirmeler: Borsa İstanbul'da İşlem Gören İmalat Sektöründeki Firmalarının Finansal Başarısızlıklarının Ölçülmesi*. Ankara: İksad Yayınevi.

Hau, V. T. and Oanh V. T. (2021). Identify Financial Risks of Pharmaceutical – Medical Firms Listed on The Vietnam Stock Exchange. *American Research Journal of Humanities & Social Science (ARJHSS)*, 4(11), 1–11.

Kablan, A. (2020). Altman's Z"-score to predict accounting based financial distress of municipalities: bankruptcy risk map for metropolitan municipalities in Turkey. *İşletme Araştırmaları Dergisi*. 12(1), 498-509.

Karadeniz, E. and Öcek C. (2020). Finansal başarısızlık tahmin modellerinin geçerliliğinin analizi: Thomas Cook örneği. *Seyahat ve Otel İşletmeciliği Dergisi*. 17(3), 394-406.

Kiracı, K. (2021). Covıd-19, Fınancıal Rısk And The Aırlıne Industry. *Mehmet Akif Ersoy University Journal of Economics and Administrative Sciences Faculty*, 8(3), 1557-1581.

Maharanı, R. and Sarı, T. A. M. (2021). Tourism Industry Bankruptcy Analysis of Impact COVID-19 Pandemic. *International Journal of Economics, Business and Accounting Research (IJEBAR),* 5(4), 339–350.

Maulidya, L. and Filianti, D. (2020). The Comparatıve Analysıs Of The Altman Z-Score And The Sprıngate Score Methods In Determınıng Fınancıal Dıstress In Sharıa Lıfe Insurance Companıes From 2014 To 2018, *Jurnal Ekonomi Syariah Teori dan Terapan*, 7 (12), 2494-2507.

Ohlson, J, A. (1980). Financial Ratios and The Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 18(1), 109–131.

Öztürk, S. and Yılmaz, C. (2019). Finansal sıkıntının muhasebe manipülasyonu ile ilişkisi: BİST gelişen işletmeler piyasasında bir uygulama. *Karadeniz Uluslararası Bilimsel Dergisi*. 41, 241-254.

Prasetiyani, E. and Sofyan, M.(2020). Bankruptcy analysis using Altman z-score model and Springate model in retail trading company listed ın Indonesia stock exchange. *Ilomata International Journal of Tax & Accounting*. 1 (3): 139-144.

Springate, G. L. V. (1978). Predicting the Possibility of Failure in A Canadian Firm. Unpublished M.B.A Thesis, Simon Eraser University. Burnaby.

Şahin, T. and Özkan, N. (2022). Covid-19'un Borsa İstanbul'da İşlem Gören Otomotiv Firmalarının Finansal Başarısına Etkisi. *Finans Ekonomi ve Sosyal Araştırmalar Dergisi*, 7(3), 516–527. DOI: 10.29106/fesa.1152427

Tekin, B. and Gör, Y. (2022). Finansal Başarısızlık Tahmin Modelleri ve Bankacılık Sektörü Mali Tabloları Üzerinden Bir Uygulama: Altman ve Springate Modelleri. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, (40), 373–404.

Türk, Z. and Kürklü, E. (2017). Financial Failure Estimate in Bist Companies With Altman (Z-Score) and Springate (S-Score) Models. *Osmaniye Korkut Ata Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 1(1), 1–14.

Wulandarı, E. Y. (2021). Penggunaan Model Springate, Ohlson, Altman Z-Score, Dan Grover Score Untuk Memprediksi Financial Distress Pada Masa Pandemi COVID-19 (Studi Pada Perusahaan Manufaktur Yang Terdaftar Di Bursa Efek Indonesia). Universitas Islam Malang Fakultas Ekonomi Dan Bisnis Malang.

Yıldız, A. (2014). Kurumsal yönetim endeksi ve Altman z skoruna dayalı lojistik regresyon yöntemiyle şirketlerin kredi derecelendirmesi. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 19 (3): 71-89.

Zmıjewskı, M. E.(1984). Methodological Issues Related to the Estimation of Financial Distress Prediction Models. *Journal of Accounting Research*, 22, 59–82.