

## FINANCIAL FAILURE in TOURISM ENTERPRISES REGISTERED in BORSA İSTANBUL (BİST)

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### ABSTRACT

Financial failure is a very broad and complex concept from an inability to pay short-term debts to bankruptcy. This study aims to determine whether differences exist between the financial ratios of failed and non-failed tourism enterprises listed on Borsa Istanbul (BİST) in terms of financial failure prediction. For this reason, the annual financial statements of 12 tourism enterprises under the 'Restaurants and Hotels' sector of Borsa Istanbul (BİST) in the period 2012-2021 are analyzed and 32 financial ratios are determined as independent variables. The companies are divided into two categories, and the dependent variable of the criterion is failure. As a result of the Mann-Whitney U test analyses done for each year; It is determined that the most frequent statistically significant differences are in terms of financial ratios related to financial structure (solvency), profitability, and liquidity. EBIT/current liabilities, EBIT/total liabilities, interest coverage ratio, and ROE are the most powerful predictors of financial failure. It is also found that liquidity and indebtedness are the most distinctive predictors of the financial failure of tourism firms in the following year of both the political crisis between Turkey and Russia happened in 2015 and the COVID-19 pandemic

*Keywords: Financial failure, Financial ratios, Tourism industry, Crisis*

## BORSA İSTANBUL'DA (BİST) KAYITLI TURİZM İŞLETMELERİNDE FİNANSAL BAŞARISIZLIK

### ÖZET

Finansal başarısızlık, kısa vadeli borçları ödeyememekten iflase kadar çok geniş ve karmaşık bir kavramdır. Bu çalışma, Borsa İstanbul'da (BİST) işlem gören başarısız ve başarısız olmayan turizm işletmelerinin finansal oranları arasında, finansal başarısızlığın tahmini açısından farklılık olup olmadığını belirlemeyi amaçlamaktadır. Bu nedenle Borsa İstanbul'un (BİST) 'Restoran ve Oteller' sektörü altında yer alan 12 turizm işletmesinin 2012-2021 dönemindeki

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yıllık mali tabloları analiz edilmiş ve 32 mali oran bağımsız değişken olarak belirlenmiştir. Firmalar iki kategoriye ayrılmış olup, kriterin bağımlı değişkeni başarısızlıktır. Her yıl için yapılan Mann-Whitney U testi analizleri sonucunda; İstatistiksel olarak farklılıkların finansal yapı (ödeme gücü), karlılık ve likidite ile ilgili finansal oranlarda olduğu belirlenmiştir. FVÖK/cari yükümlülükler, FVÖK/toplam yükümlülükler, faiz karşılama oranı ve ROE (öz kaynak karlılık oranı), finansal başarısızlığın en güçlü öngöstergeleridir. Hem Türkiye ile Rusya arasında 2015 yılında yaşanan siyasi kriz hem de COVID-19 pandemisinin bir sonraki yılında turizm firmalarının finansal başarısızlığının en ayırtedici öngörü unsurlarının likidite ve borçluluk olduğu tespit edilmiştir.

***Anahtar Kelimeler:** Finansal başarısızlık, Finansal oranlar, Mann-Whitney U testi, Turizm endüstrisi, Kriz*

## 1. INTRODUCTION

Due to some factors such as globalization, rapid changes in technology, and competition in markets is getting bigger and more serious. All these make the conditions more and more difficult. These difficulties appear in different ways for companies; everything may start for some companies by losing part of their customers and decreasing their profit. But as this situation continues, it becomes very difficult for the company to fulfill its obligations, to carry out its daily operations. Sometimes companies cannot even survive and end all their activities. All these refer to financial failure which is a very broad concept from liquidity/solvency shortage to bankruptcy. Financial failure can occur because of either internal (weak management, business life cycle, over-borrowing, lack of cash flow, or operating capital) or external reasons (economic, political and legal, social, natural, or industrial). As a result of financial failure, a company can lose its ability to solvency or go bankrupt. Moreover, financial failure can affect the industry or economy of a country where companies operate negatively. Financial fluctuations can affect and cause financial failure that also leads to crises in the economy, especially a chain failure in the industry is very dangerous for the economy of a country.

Failure is a broad concept that can occur in different ways. Although there isn't a universal definition for financial failure widely accepted in the world, it generally describes when a company's payment obligations exceed its financial savings (Park and Hancer, 2012). Several researchers defined it in different ways. For example, Beaver (1966) defined it as companies being unable to pay their maturing obligations. For Altman (1968: 593) and Ohlson (1980), it's a legally bankrupt company. Aktaş (1997) added two criteria (negative net income for three consecutive years and operation shut down due to financial crisis) to

bankruptcy, accordingly, had three criteria for failure. Olsen et al. (1983) in their studies related to restaurant failure defined it as restaurants that had cumulative negative cash flows for six consecutive months. Cho (1994) in the study investigating failure in hotels and restaurants defined it as negative net income for three or more consecutive years. Events such as a decrease in dividends, business closures, losses, CEO resignations, sudden drops in stock prices, etc. are just a few of the huge number of events that can be considered a financial failures (Ross et al., 2002). Therefore, it is difficult to fully explain the concept of financial failure. All these issues make financial failure a very crucial concept for several stakeholders such as managers, investors, creditor organizations, financial analysts and external auditors, regulatory bodies, governments, employees, and labor unions. All these parties try to prevent financial failure before it occurs. For that reason, some prediction models that include financial ratios are defined as the most powerful in failure prediction. Since appropriate financial ratios for models vary among industries and countries where companies operate, different models are developed and used in literature. This study aims to determine whether there are differences between the financial ratios of failed and non-failed tourism enterprises or not. In other words, the study aims to find out in terms of which financial ratios are statistically determining factors between the failed and non-failed enterprises in terms of financial failure prediction.

It is revealed that very few studies on this topic were done for the tourism industry including restaurants and hospitality sector (Olsen et al., 1983; Gu & Gao, 2000; Gu, 2002; Kim & Gu, 2006; Cho, 1999; Kim & Upneja, 2014). Only a few focused on the hospitality sector (Kim, 2011; Park & Hancer, 2014; Pacheco, 2015; Gámez et al., 2016). It is also observed that the number of studies on tourism industry has been increasing rapidly in recent years while reviewing the literature for this study (Kim, 2018; Vicario et al, 2020; Akbulaev et al, 2020; Shi & Li, 2021; Abidin et al, 2021; Gárcia and Miguélez, 2021). Although tourism is a very significant sector for Turkey, few financial failure studies have been done on the Turkish tourism sector (Karaca & Özen, 2017; Aktümsek & Göker, 2018; Sevim & Paslı, 2018; Karadeniz & Öcek, 2019; Karadeniz & Öcek, 2020; Karadeniz et al, 2021). Turkey has been the topmost visited destination in the world for several years. Furthermore, the tourism sector is much more dependent on and sensitive to external factors. As tourism companies are already one step closer to failure because of their high dependence and sensitivity, these enterprises should always care about their financial health. Therefore, we seek to find

out in terms of which financial ratios are statistically important to predict financial failure of the tourism sector and to make a base of tourism-related financial ratios in this paper. This study also aims to enable the researchers to gain more attention in this field (tourism) in the future and gives a view of financial failure prediction for decision-makers in the sector and stakeholders like potential investors, credit institutions, and regulatory agencies.

The following sections are organized as follows: Section 2 summarizes the literature review. Section 3 describes the methodology and data. Section 4 presents a discussion of the findings, and the last section provides the results and comments drawn from the analysis.

## **2. LITERATURE REVIEW**

The prediction of financial failure was first started due to company bankruptcies after Great Depression. However, there were no studies on how to interpret the ratios made in that period. The study by Charles Merwin is the first detailed example of this subject in 1942. In this study, 900 firms from the period 1926-1936 were analyzed, by being separated into two groups continuing and non-continuing firms (Altman, 1968). The current ratio, net worth/total debt, and networking capital/total assets are the most important ratios in detecting the failure, and the signs of the failure six years before the bankruptcy were obtained in Merwin's study.

In the next years, the most known and referred studies of financial failure prediction were done by some researchers (Beaver, 1966; Tamari, 1966; Altman, 1968). Altman included 33 bankrupt and 33 successful companies from the period 1946 to 1965 in his study. He defined the 5 best ratios to discriminate between bankrupt and successful firms via several tests and analyses. The developed model including these ratios (predictor variables) and their coefficients are called 'Z-Score Model'. Later on, Altman developed variations of the original model, the Altman  $Z_B$ -Score which can be applied to privately held enterprises, and the Altman  $Z_C$ -Score which can be applied to non-manufacturing companies (Janssen, 2011).

The most well-known failure prediction studies related to the tourism industry are discussed in this section. The study of Olsen et al.(1983) is the first attempt to test the applicability of failure prediction studies to the food service industry. They investigated 12 non-failure and 7 failure restaurants between the period 1979-1981 in the USA by using graphical analysis. Current assets to current liabilities and working capital

to total assets are determined as the most effective indicators of impending failure. Additionally, the profitability ratio, earnings before interest, and taxes (EBIT) to total assets emerge as useful predictors.

Some studies focused on the bankruptcy prediction of the restaurant sector that takes place in the tourism industry. The first empirical study that was carried out by Gu (2002) developed a multiple discriminant model for analyzing US restaurant firm bankruptcy. The model that had 92 percent accuracy revealed that low EBIT and high total liabilities are the main parameters of bankruptcy for restaurants. Using the same data set, Kim and Gu (2006a) examined a logit model and compared its' accuracy result with that of a discriminant model. Findings showed that the logit model is preferred for restaurant bankruptcy prediction due to its theoretical soundness. Researchers also advised restaurant operators to adopt a prudent financing policy and to have tight operating cost control to increase earnings before interest and taxes (EBIT). In the following years, Youn and Gu (2010a) developed failure prediction models based on financial data of US restaurant firms using both artificial neural networks (ANNs) and logistic regression. They found the logistic regression model more advantageous as an indication of reducing the chance of bankruptcy.

Park and Hancer (2012) compared the results of ANNs method to those of logit model by using 16 financial ratios of the sample combined restaurants and other tourism-related firms. The results showed that neural network (ANN) has a higher accuracy rate than the logit model in an in-sample test, but both models have a 100% accuracy rate in a holdout sample for verification when tested. The other finding was that "total liability to total assets" is the most important parameter in predicting bankruptcy. The other study which focused on restaurant industry analyzed financial distress factors for the period 1988-2010 using decision tree (DT) and AdaBoosted decision tree methods (Kim and Upneja, 2013). AdaBoosted DT which is the most successful method as an early warning system due to the smallest error overall showed financially distressed restaurants were more deeply indebted, and they had lower assets growth rates, lower current ratios, and net profit margins. Recently, Kim (2018) investigated key determinants of three hospitality-related segments, namely restaurant, hotel and motel, amusement, and recreation using ensemble models. Debt-to-equity ratio, growth in owners' equity, net profit margin, and stock-price trend were found as financial distress predictors in the restaurant-stacking model. The other recent study on the restaurant industry was examined for a

sample of Spanish restaurants by Vicario, et al (2020). The researchers concluded that financial variables related to profitability and indebtedness are the most crucial indicators of bankruptcy and the deep recurrent convolutional neural network method has a higher accurate prediction capacity than logistic regression.

Gu and Gao (2000) estimated a multivariate discriminant model for predicting hospitality firm bankruptcy including restaurants and hotels. The model had 93 percent accuracy in classifying the in-sample firms into bankrupt and non-bankrupt firms. Results showed that unprofitable firms burdened with short-term debts tend to go bankrupt. The other study including the logit model was designed for the hospitality sector by researchers, Kim and Gu (2006b). The success rate of predictive accuracy of the model in this study is the prediction accuracy rate of 91% for one year and 84 % for two years before bankruptcy. Youn and Gu (2010b) examined the failure prediction model by using ANNs and logistic regression for Korean lodging firms and found ANN model more advantageous over the logistic regression model in prediction accuracy. They also suggested that the most important signal of financial failure is interest coverage ratio in the Korean hotel industry. Kim (2011) investigated an optimal hotel bankruptcy prediction approach to lessen the empirical risk of misclassification, and functional characteristics of multivariate discriminant analysis, logistic, artificial neural networks (ANNs), and support vector machine (SVM) models in hotel bankruptcy prediction. The study revealed that ANN and SVM are much more applicable models in bankruptcy prediction for Korean hotels.

Diakomihalis (2012) tested three versions of Altman's model to determine the bankruptcy prediction and its accuracy in the hotel enterprise that falls in the "distress" zone. The researcher's general conclusion that can be realized from the analysis is that the Altman model is applicable in terms of a high degree of reliability and accuracy for private hotel firms in Greece. Following logit methodology and a set of six financial ratios, Pacheco (2015) analyzed Portuguese hospitality sector SMEs to determine the factors that have the potential default probability. The results revealed that the ratio of debt to total assets and the ratio of equity to total assets seem to be relevant in explaining failure, and overreliance on profit should be limited as an indication of good financial performance. Gámez et al. (2016) studied a sample of 108 Spanish hotels between 2005 and 2012 to determine the most sensitive variables in the prediction of insolvency by using PNN, NN, and MLP techniques. Analysis results indicated that the most relevant variable is

EBITDA to current liabilities by using data to one and two years prior to bankruptcy, but using data to three years prior to bankruptcy, return on assets (ROA) is determined as the most predictor variable.

Recently, Wieprow and Gawlik (2021) assessed the risk of bankruptcy of the Polish tourism sector firms in the crisis conditions resulting from the COVID-19 pandemic using multiple discriminant analysis (MDA) and logit models. Both models showed a visible deterioration in the financial situation of the enterprises covered in the study. They found that the number of companies at risk of bankruptcy increased significantly between the first half of 2019 and 2020. Abidin et al (2021) developed a failure prediction model for SMEs in the hospitality industry by using the logit and artificial neural network (ANN). Their findings revealed that the ANN model is more predictive than the logit model, ROA and board size are the most important signals of business failure. Lastly, Goh et al (2022) applied Altman's z-score bankruptcy prediction model to predict bankruptcy of the Thomas Cook Travel Group between the years 2008 and 2018. The findings suggested that financial ratios, as well as the size and location of the firm, are very useful in predicting the bankruptcy of a tourism and hospitality business.

### **3. METHODOLOGY and DATA PREPARATION**

#### **3.1. Methodology**

The Mann-Whitney U test, also known as Wilcoxon-Mann-Whitney or rank-sum test, is a nonparametric test for a between-subjects design using 2 levels of independent variables and scores. It is often used as an alternative for the Independent Sample t-test when there is a severe violation of the normality assumption or when the data are scaled at a level that is inappropriate for the t-test (Joaquim, 2007; Ho, 2013). Differently from the t-test, the Mann-Whitney U test compares not the mean, but the median of the two groups. To be applied, this test starts by ranking the continuous variables of two groups in ascending order. Thus, the test evaluates if there are any differences between the rankings of the groups. As the variables are put in order, the actual distribution of the values is not important (Joaquim, 2007; Kalaycı, 2006).

Some assumptions for the Mann-Whitney U test are required. The data;

- Has to be from independent random samples.
- Has to be measured at least at the ordinal level.

- Even though the actual measurements can only be naturally ordinal, the underlying dimension of the dependent variable is naturally continuous to be able to rank the whole sample uniquely, each case occurs only once in the data set (Ho, 2013; Landau and Everitt, 2003).

The hypotheses of this test are as below.

H0: The median values of independent variables in the two groups are equal.

H1: The median values of independent variables in the two groups are not equal.

The null hypothesis means that the two groups being compared have identical distributions. On the other hand, the alternative hypothesis indicates that the group distributions differ in location (the median) (Çatak, 2012; Landau et al., 2003).

### **3.2. Data Preparation**

Quantitative analyzes with secondary data were done in this study. Data for this study was obtained from Public Disclosure Platform (KAP). 12 companies under the ‘Restaurants and Hotels’ Sector of BIST Companies in KAP were accepted as the main sample of this study. The study includes the financial data of these companies from the period 2012-2021. The annual financial statements (the balance sheets, the income statements, and the cash flow statements) were analyzed for obtaining the financial data.

This study includes two types of variables; dependent and independent. The dependent variable of this study is the failure of the companies. It is a dichotomous variable with failed (coded as 0) and non-failed (coded as 1) categories. There should be some criteria to distinguish between the failed (f.) and the non-failed (nf.) companies. As a consequence of investigating the literature, the criteria were defined as follows;

- Being in Watchlist Market
- Negative equity
- 2/3 reduction in assets value
- Loss for the current year



The distribution of failed companies is as in Table 1. Independent variables of this study are various financial ratios calculated via the data collected from the annual financial statements of these companies. To define which ratios be included in the analysis the literature related to financial failure topic was searched. Especially, tourism-related studies were investigated in detail. Not all ratios from those papers were chosen for this study. Only the ones which were thought to be appropriate for the Turkish companies and a few ratios thought to be important from the other studies were included. Consequently, 32 financial ratios were decided to be included in the analysis as the independent variables.

**Table 1: Distribution of Failed Companies for Mann-Whitney U Test**

Year	Failed Companies	Reasons of Failure
2012	5	loss for the current year
2013	7	loss for the current year, negative equity
2014	7	loss for the current year, negative equity, 2/3 reduction in assets value
2015	4	loss for the current year
2016	7	loss for the current year, 2/3 reduction in assets value, being in watchlist market
2017	6	loss for the current year, being in the watchlist market
2018	5	loss for the current year, negative equity
2019	6	loss for the current year, negative equity
2020	6	loss for the current year, negative equity, being in watchlist market
2021	5	loss for the current year, negative equity, being in watchlist market

The formulas published by Central Bank of the Republic of Turkey (CBRT) were a guide in defining the ratio formulas.<sup>3</sup> These ratios can be discussed in five different groups. They are as follows (Akgüç, 2010; Akdoğan & Tenker, 2004; Şamiloğlu & Akgün, 2015);

- Liquidity ratios: These ratios measure the availability of a company to meet its short-term debt and determine whether the working (operating) capital is enough or not.

<sup>3</sup> <http://www3.tcmb.gov.tr/sektor/2021/Raporlar/oran.pdf> (accessed on: 05.01.2019)

- **Financial structure ratios:** These ratios help to measure how much of the assets are covered by short and long-term obligations, how much of it is covered by own resources, and whether there is an appropriate balance between equity and debts. These rates also give important clues about whether a company can fulfill its long-term obligations (solvency) in the cases of loss, a decrease in the value of the assets, or if it cannot generate enough funds in the future years. The coverage ratios for constant expenses are also included in this group.
- **Profitability ratios:** Profit is an important criterion to demonstrate the success of a company. These ratios provide information about whether the targeted activity results have been achieved, the predicted profit level has been reached, and whether the enterprise is managed effectively or not.
- **Activity ratios:** These ratios measure whether the assets are used effectively or not in the operational processes of a company.
- **Growth ratios.**

Information about all 32 ratios is shown in Table 2

**Table 2: Independent Variables**

<b>Liquidity Ratios</b>	
X1	Current Ratio=Current Assets/Current Liabilities
X2	Quick (Acid Test) Ratio=(Current Assets-(Inventory+Prepaid Expenses +Other Current Ratios))/ Current Liabilities
X3	EBIT/Current Liabilities
X4	Working Capital/Total Assets
X5	Operating Cash Flow Ratio (OCF)=OCF/Current Liabilities
<b>Financial Structure Ratios</b>	
X6	Debt (Leverage) Ratio=Total Debt/Total Assets
X7	Debt to Equity Ratio=Total Debt/ Shareholders' Equity
X8	Equity Multiplier=Total Assets/ Shareholders' Equity
X9	Short-term Debt/Total Assets
X10	Short-term Debt/Paid-in-capital
X11	Debt/EBITDA
X12	OCF/Total Debt
X13	EBIT/Total Debt

X14	Paid-in-capital/Shareholders' Equity
X15	Interest Coverage Ratio=EBIT/Interest Expenses
<b>Profitability Ratios</b>	
X16	Gross Profit Margin=Gross Profit/Net Sales
X17	Net Profit Margin=Net Profit/Net Sales
X18	Return on Assets (ROA)=Net Income/Total Assets
X19	Return on Equity (ROE)=Net Income/Shareholders' Equity
X20	Economic Rantability Ratio=EBIT/Total Liabilities and Shareholders' Equity
X21	Return on Capital Employed (ROCE)=EBIT/Capital Employed
X22	Operating Profit Margin=Operating Income/Net Sales
<b>Activity Ratios</b>	
X23	Assets Turnover Ratio=Net Sales/Total Assets
X24	Fixed Assets Turnover Ratio=Net Sales/Total Fixed Assets
X25	Inventory Turnover Ratio=COGS/ Average Inventory
X26	Accounts Receivable Turnover Ratio=Net Sales/Short-term Trade Receivables +Long-term Trade Receivables
X27	Equity Turnover Ratio=Net Sales/Shareholders' Equity
<b>Growth Ratios</b>	
X28	Growth in Assets
X29	Growth in Equity
X30	Growth in Revenue
X31	Growth in Operating Income
X32	Growth in Net Income

#### 4. DISCUSSION of FINDINGS

First of all, it was tested whether a failure prediction model could be developed in the study. Discriminant analysis was selected to develop a failure prediction model. Before applying this analysis, multicollinearity problem was checked. As a consequence of testing 32 predictor variables, multicollinearity was determined among some of them. Predictors with high collinearity ( $VIF \geq 10$ ,  $TV \leq 0.10$ ) were removed from the analysis.

After eliminating multicollinearity problem, normality tests were done on the remaining independent variables. As a result of these tests, it was determined that these variables were not normally distributed for any of the years. Thus, discriminant analysis couldn't be applied.

An alternative statistical method called logistic regression analysis was tried instead. However, this analysis also failed to be applied. This time the reason was the sample size. Unfortunately, 12 companies in the data set were too few for applying this analysis. Consequently, this study failed in obtaining any model related to failure prediction.

Some researchers used Mann-Whitney U test for comparing two groups in their financial failure-related studies (Gülcan, 2011; Çatak, 2012; Kim and Upneja, 2014). In this study, firstly normality tests were done on all the variables of each year. According to the results of this test, all the variables do not follow a normal distribution. Because of the violation of the normality assumption, the Mann-Whitney U test can be applied in this study.

As was described in the previous section, the Mann-Whitney U test is for comparing two independent groups. So, for this test, there is no need for ‘as many companies as possible. In this study, the Mann-Whitney U test helps to understand whether the median of failed and non-failed firms is statistically different or not. Hypotheses for the Mann-Whitney U test are as below:

- H1.0: The median values of failed and non-failed companies are equal in terms of liquidity ratios in tourism enterprises of Turkey.
- H2.0: The median values of failed and non-failed companies are equal in terms of financial structure ratios in tourism enterprises of Turkey.
- H3.0: The median values of failed and non-failed companies are equal in terms of activity ratios in tourism enterprises of Turkey.
- H4.0: The median values of failed and non-failed companies are equal in terms of profitability ratios in tourism enterprises of Turkey.
- H5.0: The median values of failed and non-failed companies are equal in terms of growth ratios in tourism enterprises of Turkey.
- H6.0: The median values of failed and non-failed companies are equal in tourism enterprises of Turkey.

This test was applied each year to understand whether the median of failed and non-failed firms is statistically different or not. If p-value is below 0.05, then the null hypothesis is rejected at the significance level of 5%, viz., there is a statistically significant difference between the median values of failed and non-failed companies, they are not equal. On the other hand, if the result for p-value is above 0.05, this means the study

fails to reject the null hypothesis, viz., there is no statistically significant difference between failed and non-failed firms, and the median values of the two groups are equal.

The analysis was realized for each year one by one including variable names, mean ranks for both failed codes of (0) and non-failed codes of (1), p-values, and null hypothesis. While the summary of the Mann-Whitney U test results is shown in Table 3 and Table 4, rejected hypothesis results are presented in Appendix for each year (failed to reject hypotheses are not taken due to limited space).

**Table Hata! Belgede belirtilen stilde metne rastlanmadı.: Statistically Significant Ratios for Each Year**

Year	Statistically Significant Ratios
2012	EBIT/current liabilities, debt/EBITDA, EBIT/total debt, interest coverage ratio, gross profit margin, growth in operation income, growth in net income
2013	quick ratio, gross profit margin, economic rantability, growth in equity ratio, growth *in net income
2014	quick ratio, EBIT/current liabilities, debt ratio, short-term debt/total assets ratio, EBIT/total debt ratio, interest coverage ratio, net profit margin, ROA, ROE, economic rantability, ROCE, inventory turnover ratio
2015	current ratio, EBIT/current liabilities, operating cash flow/total debt, EBIT/total debt, interest coverage ratio, net profit margin, ROA, ROE, economic rantability, ROCE, operating profit margin, growth in operating ratio
2016	quick ratio, debt ratio, debt/equity, equity multiplier, inventory turnover ratio
2017	current ratio, quick ratio, EBIT/current liabilities, EBIT/total debt, interest coverage ratio, net profit margin, ROA, ROE, economic rantability, ROCE, operating profit margin, growth in net income
2018	EBIT/current liabilities, ROE, growth in net income
2019	EBIT/total debt, interest coverage ratio, net profit margin, ROA, ROE
2020	short-term debt/total assets, short-term debt/paid-in capital
2021	quick ratio, debt to equity ratio, equity multiplier, growth in net income

The interpretations below can be made about the Mann-Whitney U test results shown in Table 3. Discussions of the results for each year are below.

- In 2012 the statistically significant differences between the failed and non-failed companies occurs in terms of liquidity (1),

financial structure (3), profitability (1), and growth ratios (2). It can be said that financial structure, in other words, solvency ratios group seems the most distinctive.

- For 2013 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios liquidity (1), profitability (2), and growth ratios (2). None of financial structure and activity ratios is statistically significant.
- For 2014 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios such as liquidity (2), financial structure (4), profitability (5), and activity ratios (1). It can therefore be concluded that profitability ratios are the most distinctive
- For 2015 the statistically significant differences between the failed and non-failed companies occur in terms of liquidity (2), financial structure (3), profitability (6), and growth ratios (1). The most frequent ratio group is profitability as can be seen.
- For 2016 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios such as liquidity (1), financial structure (3), and activity ratios (1). Financial structure ratio group is more distinctive statistically this year.
- For 2017 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios such as liquidity (3), financial structure (2), profitability (6), and growth ratios (1). It can be concluded that profitability ratio group is the most distinctive in 2017 among two groups
- For 2018 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios liquidity (1), profitability (1), and growth (1). There is no distinctive ratio group in 2018.
- For 2019 the statistically significant differences between the failed and non-failed companies occur in terms of financial structure (2) and profitability (3). Only two ratio groups have been distinctive while the others don't exist.
- For 2020 only financial structure ratios (2) are statistically distinctive between the failed and non-failed companies.

- For 2021 there are statistically significant differences between the failed and non-failed enterprises in terms of the ratios liquidity (1), financial structure (2), and growth (1). None of the profitability and activity ratios is statistically significant.

Every year there are both statistically significant (H6.0 rejected), and not significant (H6.0 failed to reject) differences between the failed and non-failed enterprises in terms of various financial ratios. But if speaking generally, 23 out of 32 financial ratios are at least once statistically significant distinction between two groups. Considering this, for tourism enterprises in Turkey H6.0 can be rejected. In other words, the median values of the failed and non-failed tourism enterprises in Turkey are not equal.

**Table 4: Frequencies of Statistically Significant Ratios**

Ratio	Frequency	Year(s)
<b>Liquidity Ratios</b>		
Current Ratio	2	2015, 2017
Quick Ratio	5	2013, 2014, 2016, 2017, 2021
EBIT/Current Liabilities	5	2012, 2014, 2015, 2017, 2018
<b>Financial Structure</b>		
Debt Ratio	2	2014, 2016
Debt to Equity Ratio	2	2016, 2021
Equity Multiplier	2	2016, 2021
Short-term Debt/Total Assets	2	2014, 2020
Short-term Debt/Paid-in Capital	1	2020
Debt/EBITDA	1	2012
OCF/Total Debt	1	2015
EBIT/Total Debt	5	2012, 2014, 2015, 2017, 2019
Interest Coverage Ratio	5	2012, 2014, 2015, 2017, 2019
<b>Profitability Ratios</b>		
Gross Profit Margin	2	2012, 2013
Net Profit Margin	4	2014, 2015, 2017, 2019
ROA	4	2014, 2015, 2017, 2019
ROE	5	2014, 2015, 2017, 2018, 2019
Economic Rantability	4	2013, 2014, 2015, 2017

ROCE	3	2014, 2015, 2017
Operating Profit Margin	2	2015, 2017
<b>Activity Ratios</b>		
Inventory Turnover Ratio	2	2014, 2016
<b>Growth Ratios</b>		
Growth in Equity	1	2013
Growth in Operating Income	2	2012, 2015
Growth in Net Income	5	2012, 2013, 2017, 2018, 2021

If it is assumed as being statistically significant in differentiation between two groups as a little effect in failure prediction, the other hypotheses of this study can be interpreted as follows based on Table 4;

- The most frequent ratios in the liquidity group are EBIT/current liabilities (2012, 2014, 2015, 2017, and 2018) and quick ratio (2013, 2014, 2016, 2017, and 2021). Liquidity ratios have a statistically distinctive between the failed and non-failed enterprises every year except for 2 years (2019 and 2020). Considering this, H1.0 can be rejected. In other words, liquidity ratios affect the prediction of financial failure in tourism enterprises in Turkey.
- 9 of 10 financial structure ratios are at least once statistically significant. The most frequent ratios in this group are EBIT/total debt and interest coverage ratio (both in 2012, 2014, 2015 2017, and 2019). However, in 2013 and 2018 none of these ratios were statistically significant. Considering all of these, H2.0 can be rejected. In other words, financial structure ratios affect the prediction of financial failure in tourism enterprises in Turkey.
- In 2014, 2015, and 2017 the profitability ratios group is the most statistically significant in differentiation between the two groups (5,6, and 6 respectively). But in 2016, 2020, and 2021 none of these ratios were statistically significant. The most frequent statistically significant ratio in this group is ROE. All the profitability ratios are statistically significant in the period. In the sequence of these results, H3.0 can be rejected. In other words, profitability ratios affect the prediction of financial failure in tourism enterprises in Turkey.



- Among activity ratios, only inventory turnover ratio is twice (2014 and 2016) statistically significant in differentiation between the two groups. Thus, this time H4.0 failed to be rejected. In other words, activity ratios do not affect the prediction of financial failure in the tourism enterprises of Turkey.
- 3 of 5 growth ratios are statistically significant in differentiation between the failed and non-failed enterprises. The most frequent statistically significant ratio in this group is growth in net income (2012, 2013, 2017, 2018, and 2020). In five years of the total period (10 years), these ratios are unresponsive to significance in differentiation between the two groups. This group ratio can be described as slightly distinctive in comparison to liquidity, financial structure, and profitability ratios. So, this study can fail to reject H5.0. In other words, growth ratios do not affect the prediction of financial failure in the tourism enterprises of Turkey.

## 5. CONCLUSION

The findings indicate that the best predictors of the financial failure of tourism enterprises in Turkey are the financial ratios related to financial structure (solvency), profitability, and liquidity. This result partially coincides with the study of Vicario et al (2020). Other variables related to activity and growth are not significant in predicting financial failure. The results also suggest that interest coverage ratio and EBIT/total debt are determined as the most powerful predictors of financial failure among solvency indicators for tourism enterprises. In general, indebtedness is believed to increase the risk of firms. Therefore, the result related to interest coverage ratio is consistent with Youn and Gu(2010b), and the result related to EBIT/total debt is consistent with Gu (2002), Gao (1999), and Kim and Gu (2006a). However, the same results are inconsistent with the findings of Olsen et al (1983), Gámez et al (2016), Aktümsek and Göker (2018), and Park and Hancer (2012).

Furthermore, financial ratios of profitability are found to differentiate non-failed enterprises from failed ones in terms of bankruptcy. ROE is determined as the most powerful predictor of financial failure among profitability variables for tourism enterprises. It is followed by ROA, net profit margin, and economic rentability. In general, profitability contributes to the ability to reduce financial distress.

This result is consistent with Gu and Gao (2000), Kim and Upneja (2018), Gámez et al. (2016) and Kim (2018).

Quick ratio and EBIT/current liabilities are the most frequent ratios in the liquidity group. Financial failure probability can be minimized if solvency is supported by efficient liquidity in the tourism sector. It is agreed that a firm with efficient liquidity uses less debt and carries a lower risk of financial distress. Thus, liquidity is related to financial health (Shi and Li, 2021).

The results suggest that non-failed businesses pay their short-term debts with liquid assets and their total debt liabilities with annualized EBITDA (EBIT/current liabilities and EBIT/total debt) and interest expenses (interest coverage ratio). It is also concluded that tourism firms are more successful with the effective use of funds invested by shareholders (ROE and economic rentability).

Lastly, Finally, both the political crisis between Russia and Turkey due to the downing of Russian planes in late 2015 and the COVID-19 pandemic, which was felt especially in 2020 and caused a policy of closure and travel restrictions all over the world, showed its effect in the following year of events. In 2016 and 2021, indebtedness (debt to equity and equity multiplier) and liquidity (current ratio) came to the fore even more in the distinction between failed and non-failed tourism firms. In 2020, when the crisis was felt the most, the number of distinctive factors between failed and non-failed businesses was 2 and was limited only to solvency ratios (short-term debt/total assets, short-term debt/paid-in capital). It can be said that short-term debt-paying ability is the most distinctive feature of financial failure in the case of tremendous distress resulting from COVID-19 for the tourism industry.

The biggest limitation of this study is the sample size, 12 observations are too small in terms of a pairing of failed and non-failed firms. The lack of bankrupt companies is another limitation. A sample without bankrupt companies is less effective in developing a model, and the model developed by this kind of sample may be less reliable. Thus, another statistical test named Mann-Whitney U test was applied. In days to come, this study expects more attention from other researchers in this field, to financial failure in tourism enterprises. Future studies could examine some other financial and economic variables, such as intangible fixed assets, intellectual capital, size of the company, and corporate governance of the hotel and restaurant industry. This study could be renewed for longer periods including the global economic recession resulting from Ukraine-Russia War. Lastly, it could be done by covering

other sectors related to tourism, such as travel agencies, tour operators, food and beverage, and transportation firms that are not registered in the organized stock exchange market.

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**APPENDIX****Mann-whitney U test results for 2012**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	EBIT/Current Liabilities	3.00	9.00	0.003	Rejected
<b>F.structure</b>	Debt/EBITDA	3.00	9.00	0.003	Rejected
	EBIT/Total Debt	4.00	8.29	0.048	Rejected
	Interest Coverage Ratio	3.00	9.00	0.003	Rejected
<b>Profitability</b>	Net Profit Margin	3.00	9.00	0.003	Rejected
	ROA	3.00	9.00	0.003	Rejected
	ROE	3.00	9.00	0.003	Rejected
	E. Rantability Ratio	3.00	9.00	0.003	Rejected
	ROCE	3.00	9.00	0.003	Rejected
	Operating Profit Margin	3.00	9.00	0.003	Rejected
<b>Growth</b>	Growth in Operating Income	2.50	8.00	0.006	Rejected
	Growth in Net Income	2.00	7.00	0.017	Rejected

**Mann-whitney U test results for 2013**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	Quick Ratio	4.43	9.40	0.018	Rejected
<b>Profitability</b>	Net Profit Margin	4.00	10.00	0.003	Rejected
	ROA	4.00	10.00	0.003	Rejected
	ROE	4.71	9.00	0.048	Rejected
	ROCE	4.71	9.00	0.048	Rejected
	Operating Profit Margin	4.71	9.00	0.048	Rejected
<b>Growth</b>	Growth in Equity	4.29	9.60	0.010	Rejected
	Growth in Net Income	2.00	6.00	0.036	Rejected

**Mann-whitney U test results for 2014**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	EBIT/Current Liabilities	4.00	10.00	0.003	Rejected
<b>F.structure</b>	Debt Ratio	8.86	3.20	0.005	Rejected
	Short-term Debt/Total Assets	8.57	3.60	0.018	Rejected
	EBIT/Total Debt	4.00	10.00	0.003	Rejected
	Interest Coverage Ratio	4.00	9.50	0.006	Rejected
<b>Profitability</b>	Net Profit Margin	3.50	9.00	0.004	Rejected
	ROA	4.00	10.00	0.003	Rejected
	ROE	4.71	9.00	0.048	Rejected
	Economic Rantability Ratio	4.14	9.80	0.005	Rejected
	ROCE	4.43	9.40	0.018	Rejected
<b>Activity</b>	Inventory Turnover	4.43	8.75	0.042	Rejected

**Mann-whitney U test results for 2015**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	Current Ratio	3.5	8.0	0.048	Rejected
	EBIT/Current Liabilities	2.50	8.50	0.004	Rejected
<b>F.structure</b>	Operating CF. Ratio	3.50	8.00	0.048	Rejected
	EBIT/Total Debt	2.50	8.50	0.004	Rejected
	Interest Coverage Ratio	2.50	8.00	0.006	Rejected
<b>Profitability</b>	Net Profit Margin	2.50	8.50	0.004	Rejected
	ROA	2.50	8.50	0.004	Rejected
	ROE	2.50	8.50	0.004	Rejected
	E. Rantability Ratio	2.50	8.50	0.004	Rejected
	ROCE	2.50	8.50	0.004	Rejected
	Oper. Profit Margin	2.50	8.50	0.004	Rejected
<b>Growth</b>	Growth in Oper.Income	1.50	6.50	0.044	Rejected



**Mann-whitney U test results for 2016**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	Quick Ratio	4.71	9.00	0.048	Rejected
<b>F.structure</b>	Debt Ratio	8.57	3.60	0.018	Rejected
	Debt to Equity Ratio	8.57	3.60	0.018	Rejected
	Equity Multiplier	8.57	3.60	0.018	Rejected
<b>Activity</b>	Inventory Turnover	4.29	9.00	0.024	Rejected

**Mann-whitney U test results for 2017**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	Current Ratio	4.17	8.83	0.026	Rejected
	Quick Ratio	4.00	9.00	0.015	Rejected
	EBIT/Current Liabilities	3.50	9.50	0.002	Rejected
<b>F.structure</b>	EBIT/Total Debt	4.00	9.00	0.015	Rejected
	Interest Coverage Ratio	3.50	9.50	0.002	Rejected
<b>Profitability</b>	Net Profit Margin	3.50	9.00	0.004	Rejected
	ROA	3.50	9.50	0.002	Rejected
	ROE	3.50	9.50	0.002	Rejected
	Economic Rantability Ratio	3.67	9.33	0.004	Rejected
	ROCE	3.67	9.33	0.004	Rejected
	Operating Profit Margin	3.83	8.60	0.017	Rejected
<b>Growth</b>	Growth in Net Income	2.00	6.50	0.024	Rejected

**Mann-whitney U test results for 2018**

	<b>Variable</b>	<b>Mean Rank (0)</b>	<b>Mean Rank (1)</b>	<b>p-value</b>	<b>H6.0</b>
<b>Liquidity</b>	EBIT/Current Liabilities	3.50	8.00	0.048	Rejected
<b>Profitability</b>	ROE	3.38	8.06	0.033	Rejected
<b>Growth</b>	Growth in Net Income	3.38	8.06	0.028	Rejected

**Mann-whitney U test results for 2019**

	Variable	Mean Rank (0)	Mean Rank (1)	p-value	H6.0
<b>Profitability</b>	Net Profit Margin	3.00	8.50	0.006	Rejected
	ROA	3.00	8.50	0.006	Rejected
	ROE	3.00	8.50	0.006	Rejected
<b>F.structure</b>	EBIT/Total Debt	3.60	8.00	0.030	Rejected
	Interest Coverage Ratio	3.80	7.83	0.045	Rejected

**Mann-whitney U test results for 2020**

	Variable	Mean Rank (0)	Mean Rank (1)	p-value	H6.0
<b>F.structure</b>	Short-term Debt/Total Assets	8.83	4.17	0.026	Rejected
	Short-term Debt/Paid-in Capital	8.83	4.17	0.026	Rejected

**Mann-whitney U test results for 2021**

	Variable	Mean Rank (0)	Mean Rank (1)	p-value	H6.0
<b>Liquidity</b>	Quick Ratio	3.60	8.57	0.019	Rejected
<b>F.structure</b>	Debt to Equity Ratio	9.20	4.57	0.028	Rejected
	Equity Multiplier	9.20	4.57	0.028	Rejected
<b>Growth</b>	Growth in Net Income	4.00	8.29	0.042	Rejected