

Financial distress in the Austrian tourism industry: hotels and restaurants analysis

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Abstract

Considering the limited number of studies on the early detection of crises and insolvencies in the tourism industry, there are several research gaps. Therefore, this study analyzes which financial and non-financial variables significantly influence the financial distress of the tourism businesses (hotels and restaurants) in Austria. The resource-based and network-based views were used as theoretical foundations to determine which variables influence the probability of financial distress, with a total of 776 observations from 2005 to 2015 inclusive. The results show that variables describing the endogenous unsystematic risk of tourism businesses (firm-specific level and destination level) make the greatest contribution to explaining financial distress, while exogenous unsystematic and exogenous systematic risk variables show little or no relevance.

Keywords: Financial distress, Hotel, Network-based view, Resource-based view, Restaurant, Tourism.

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1. Introduction

The tourism industry in the context of early crisis and insolvency detection seems highly relevant because it is a high-risk industry (Zhai *et al.*, 2015). This can be illustrated and confirmed for Austria by the following time series of insolvency rates (see *Table 1*) based on reports by Creditreform. The figures show that the bankruptcy rate for hotels and restaurants is almost higher than the general bankruptcy rate for all sectors in all years under review. Based on Altman (1969), bankruptcies are market imperfections, and the number of bankruptcies is an indicator of the robustness of an economy. Bernanke (1981) argued in this context that bankruptcies increase net social costs and that it is, therefore, in the public interest to identify insolvencies as early as possible to initiate countermeasures. This can also reduce the associated direct (e.g., diminishing assets, fees for lawyers, etc.) and indirect (e.g., loss of market share, declining productivity, etc.) insolvency costs (Almeida & Philippon, 2007; Chalupka & Kopečni, 2009) that potentially represent losses for investors and creditors.

The available figures do not show the full extent of the problems in the tourism industry. In this context, Doubek *et al.* (2016) state that in economic reality, many companies are in a crisis. However, it is not reflected in official statistics. The state "insolvency" represents an acute crisis phase, which, if not overcome, leads to bankruptcy (Haber, 2005). In this state, a foreclosure and exit of the company from the market occurs (Bee *et al.*, 2004). Accordingly, the early detection of insolvencies and bankruptcies is rather the detection of a very late crisis phase. Thus, it is better from a business management point of view to detect earlier and less acute crisis phases (Exler & Situm, 2019, 41).

An upstream crisis phase is a financial distress. This phase is characterized by a significant and persistent decline in the firm's performance, which in the absence of countermeasures, can lead to the state of bankruptcy. Based on research findings, it can be concluded that the earlier a crisis phase (however defined) can be identified, the easier and less costly a turnaround can be initiated. The remarks underline the opinion in the literature that the accurate prediction of financial distress is one of the most important decision-making problems in business (Kim, 2018; Mousavi & Ouenniche, 2018).

Table 1. *Bankruptcy rates of the tourism industry in Austria between 2008 and 2020.*

Year	Bankruptcies per 1,000 companies in general	Bankruptcies per 1,000 companies hotels and restaurants
2008	22.1	17.7
2009	18.8	19.5
2010	18.1	22.8
2011	16.8	21.3
2012	17.0	17.3
2013	15.3	16.4
2014	15.2	18.3
2015	11.3	18.4
2016	11.5	17.3
2017	11.1	18.3
2018	10.9	16.1
2019	10.9	16.7
2020	6.5	9.4

Despite the circumstances outlined, a look at the research shows that a manageable number of studies have dealt with the early detection of crises and insolvencies in tourism businesses. A closer look reveals that these studies have concentrated on a few specific countries worldwide. It can be stated that the size and age of the tourism business influence (Abidin *et al.*, 2021; Belda & Cabrer-Borrás, 2021; Parsa *et*

al., 2015, 2011) the probability of crisis and insolvency. Furthermore, the figures of the financial statement analysis have high importance in all studies to describe the health status of tourism businesses (debt ratio [Gu, 2002; Kim & Gu, 2006; Park & Hancer, 2012], profitability [Kim, 2011; Zhai *et al.*, 2015] or even liquidity [Diakomihalis, 2012; Kim, 2011]). In addition to these, some non-financial variables have significant explanatory power.

Based on the literature review, several research gaps can be found. First, studies concentrate on a few countries worldwide. However, no study for Austria exists. In the context of this study, data from Austrian hotels and restaurants were used to examine whether existing realizations of other countries can be transferred to Austria. Second, it is noticeable that almost all studies have focused on the analysis of the states of bankruptcy, failure, and insolvency, which according to research findings, represent the end stages of the entrepreneurial life cycle. An unresolved state of failure leads to state insolvency, and when the situation of insolvency cannot be overcome, bankruptcy occurs (Bee *et al.*, 2004; Haber, 2005). The state of financial distress differs significantly from bankruptcy, which occupies an upstream crisis phase, to the aforementioned states (Gupta *et al.*, 2018; Platt & Platt, 2002). From the current perspective, therefore, there is a lack of knowledge in tourism research on which variables and factors affect the probability of financial distress and whether a similar pattern is observable in studies related to other industries.

Third, only a rudimentary analysis has been conducted on the extent to which domestic macroeconomic variables impact the financial and economic situation of tourism businesses and how they may influence the likelihood of financial distress. This influence can be assumed based on previous studies (e.g., Bleile, 1983; Chen, 2013; Gemar *et al.*, 2019; Pulido-Fernández & Cárdenas-García, 2021). Additionally, it was modeled and investigated using selected indicators. Fourth, only a few studies have taken into account the location of the business and the surrounding region/destination. This seems to be highly relevant, especially for tourism businesses, as Enright & Newton (2004) stated in this context that destination competitiveness is one of the most important success factors for the tourism industry. Thus, several variables were included to determine the characteristics of the location/region to describe the probability of financial distress of tourism businesses.

Besides the gaps mentioned, it is also evident that studies related to the prediction of financial distress, etc., mainly do not ground on a theoretical framework, which constitutes another relevant aspect in this research field and the tourism industry. According to this paper, a synthetic approach was applied using a resource-based view (RBV) and network-based view (NBV) as a theoretical framework that was coupled with relevant variables capturing the above-mentioned deficits in research. Therefore, the guiding research question of this paper is: Which variables and factors are relevant to explain the financial distress in the Austrian tourism industry?

This study is structured as follows. In the second section, a comprehensive literature review is provided, and the current state of research on crisis and insolvency leadership recognition in the tourism industry is determined. In the following section, the research hypotheses are developed based on the RBV and NBV considerations. The fourth section presents the data basis, the variables used, and a description of the methodology applied. The fifth section contains a detailed presentation and discussion of the results obtained, which are subsequently discussed in the sixth section. Here, the results of the hypothesis testing are presented, and the research questions are answered. The paper concludes with a summary of the results, a derivation of their implications for the tourism industry, and a discussion of the limitations of the study and possible recommendations for further studies.

2. Literature review

The number of studies that have dealt with the early detection of crises and insolvencies in tourism businesses is manageable. *Table. A1* summarizes the studies that have dealt with this topic, with the order of the studies based on the year of publication (from oldest to newest study). Grounded on the presentation, the current state of research and knowledge in the outlined subject area can be derived.

The most relevant variables to explain bankruptcy, failure, etc., are ratios of financial statement analysis. Despite the criticisms regarding the use of financial statement ratios for analyzing the financial and economic state of the company (e.g., backward-looking character [Anderson, 2007, 137; Madrid-Guijarro *et al.*, 2013], lack of information regarding the future performance of the company [Anderson, 2007, 137], or even the possibility that managers "manipulate" the numbers following valuation margins [Beaver, 1968; Mousavi *et al.*, 2022; Viana Jr *et al.*, 2022]), certain empirical studies show that they are particularly well suited to separate poorly and well-performing companies or financially distressed from non-financially distressed companies (Hensher *et al.*, 2007; Holder-Webb & Cohen, 2007; Piotroski, 2000). This is because they have useful and timely information for investors (El Hennawy & Morris, 1983; Lev & Ohlson, 1982).

In general, the risk of tourism businesses (and thus their probability of insolvency) is increasing with an increase in debt (Abidin *et al.*, 2021; Axioglou & Christodoulakis, 2021; Chen, 2013; Upneja & Dalbor, 2001). Furthermore, profitability or profit margins (measured according to different possibilities, e.g., EBIT/TA, NI/S, NI/TA, ROE) appear to be a relevant explanatory variable. Hua *et al.* (2013) state in this context that profit margins are a good proxy for measuring managerial efficiency and that higher profitability leads to a lower probability of insolvency. Finally, liquidity ratios (also subsumable under capital turnover) (e.g., WC/TA, CA/TA, etc.), which are generally relevant explanatory variables in the early detection of crises and insolvencies, should be mentioned (Amoa-Gyarteng, 2021; Carter & Van Auken, 2006; Habib & Kayani, 2022).

Kim & Gu (2010) show that hospitality firms that generate too little operating cash flow have a higher vulnerability of bankruptcy. Based on Fernández-Gámez *et al.* (2016) and Park & Hancer (2012), such companies have less liquidity and, therefore, difficulties servicing short- and long-term debt obligations. In addition to figures from financial statement analysis, non-financial variables also showed significant results in explaining insolvency, bankruptcy, etc. This supports the general finding in crisis and insolvency prediction that prediction models should consist of a combination of financial and non-financial variables to increase their classification accuracy (e.g., Balasubramanian *et al.*, 2019; Beaver *et al.*, 2005; El Hennawy & Morris, 1983; Grunert *et al.*, 2005; Ragab & Saleh, 2022). Thus, some studies show that the location of the company, as well as the region in which it is established, has an impact on its financial and economic condition. For example, Parsa *et al.* (2005) state that restaurants in ZIP codes with a high concentration of competitors have a higher failure rate.

Similarly, Parsa *et al.* (2011) argued that ZIP-code mortality is generally an important factor in explaining the possibility of revenue generation. Gemar *et al.* (2019) established that hotels in tourism regions are three times more likely to close. Some studies also indicate that the size and age of the company have a significant influence in explaining bankruptcies. For example, Parsa *et al.* (2011) and Parsa *et al.* (2015) showed that the longevity of restaurants increases as the size of the company increases and the failure rate decreases, respectively, which can be explained based on the larger resources. Belda & Cabrer-Borrás (2021) came to a similar conclusion for hospitality firms. Regarding age, Abidin *et al.* (2021) and Belda & Cabrer-Borrás (2021) showed that older hospitality firms have a higher probability of survival and a lower probability of bankruptcy, respectively. In addition to the variables mentioned above, other

significant variables are relevant, which can be seen in *Table. A1*. Essentially, these are non-financial variables such as affiliation, management practices, legal form, or board size.

3. Theoretical framework and hypotheses development

Most studies on the early detection of crises and insolvencies are not based on a theoretical framework because they aim to achieve the highest possible classification accuracy (Situm, 2016). The applicability of the RBV to the outlined problem is based on the representations of Barney (2001), who elaborated that it can be applied to a wide variety of research problems. Nevertheless, the RBV does not appear to be suitable as a sole theory base since it is limited at the firm level (Hong, 2008, 39) and should be combined with another theoretical base, starting from Arend & Lévesque (2010), Lockett *et al.* (2009) or Priem & Butler (2011), for which the NBV was used.

3.1. Resource-based-view (RBV)

Based on the RBV, performance differences between companies can be explained by the fact that certain companies operate more efficiently than others (Peteraf, 1996) and are, therefore, more successful (Armstrong & Shimizu, 2007). Based on the results of their empirical study, Alberca & Parte (2018) argue that the efficiency of tourism businesses is an important driver of business success. Thus, resources should be used as efficiently as possible. The relevance of RBV can be argued based on the research findings of Parsa *et al.* (2005). They describe that restaurant failures are more influenced by internal factors than by external factors. This supports the general view of Cook *et al.* (2011) that the RBV provides a thorough explanatory basis for explaining SME success and failure.

Companies that have established themselves in the market have made the right strategic decisions in the past (Esteve-Pérez & Mañez-Castillejo, 2008), which are also the foundations for growth. Thus, growth occurs over a period of time, and this shows the correlative entanglement between company size and age (Jovanovic, 1982; Thornhill & Amit, 2003). Larger firms can innovate better than smaller firms due to the resources available to them. This increases the chance that competitive advantage and hence efficiency can be achieved (Jovanovic & MacDonald, 1994). Company size is a good proxy to evaluate past performance and also an indicator of future performance and risk (Ben-Zion & Shalit, 1975). In this context, Chen (2013) found for the hotel industry in China that size is an important variable in describing enterprise risk in the sense that larger enterprises can reduce their systematic and total risk.

Along with this, the "liability of smallness" shows that small companies have a higher probability of insolvency (Aldrich & Auster, 1986; Williams, 2014a). Larger companies have more resources and capacity, allowing them to operate successfully for longer periods (Jovanovic & MacDonald, 1994; Peteraf, 1993). Therefore, they generally have a lower probability of failure because, for example, they have a lower risk per unit of money invested or better access to sources of financing (Castanias, 1983). In the restaurant industry, company size is positively related to performance and operational efficiency, considering that larger companies have higher performance (Alberca & Parte, 2018).

A similar result was shown by Fernández & Becerra (2015) for hotels, namely that larger companies have higher efficiency ratios. In this context, Parsa *et al.* (2011) state that with increasing company size, resources also increase, which is reflected in a longer survival period. The size of the company and the higher resources associated with it also appear to be a protection against a downturn in the economy. Larger firms are more resilient because they have more robust networks of production and distribution and better access to sources of liquidity, which increases their likelihood of survival (Axioglou & Christodoulakis, 2021).

Regarding the age of the company, the liability of age approach can be mentioned, which shows that older companies have more experience and expertise than younger companies so that they can better use their resources (and also their knowledge) to gain a competitive advantage (Kücher *et al.*, 2020). Consequently, older firms can innovate better than younger firms, leading to a competitive advantage (Jovanovic & MacDonald, 1994). Therefore, firm age can be used as a proxy to describe the skills and resources of a firm (Cerrato & Piva, 2012). Thus, this variable plays an important role in the RBV framework (Lumpkin *et al.*, 2010; Pfeffer & Salancik, 1978, 2). Related to hospitality enterprises, Belda & Cabrer-Borrás (2020) showed that age influences the survival of hospitality enterprises. Several studies confirm that as the age of the enterprise increases, the probability of crisis and insolvency decreases (e.g., Altman *et al.*, 2010; Madrid-Guijarro *et al.*, 2011). Supported by the previous findings, the following research hypotheses were formulated.

H1: Larger hotels and restaurants have a significantly lower probability of financial distress.

H2: Older hotels and restaurants have a significantly lower probability of financial distress.

In the previous research hypotheses, a linear relationship was postulated between company size or age and the probability of financial distress. Based on the concepts of liability of newness and liability of aging (Aldrich & Auster, 1986; Freeman *et al.*, 1983), it can be assumed that the probability of insolvency decreases with increasing firm age. Anders & Szczesny (1998) and Jovanovic (1982) explain this with the fact that young companies are in a phase of self-discovery, do not know the market potential, and do not have a clear orientation. Companies that survive this first critical phase can develop their potential, and establish themselves in the market (Jovanovic & MacDonald, 1994). As companies age, they become less flexible and less willing to learn, so their probability of insolvency increases again (Anders & Szczesny, 1998).

This finding supports the statements of Dickinson (2011), who explained that a company does not necessarily move linearly through the corporate lifecycle. This is also in line with the general assumption in crisis and insolvency research that the crisis evolution process is characterized by non-linear movements of a company within and between the individual crisis phases (Deeg, 2009; Pretorius, 2009). In general, the progression can be understood as a degenerative process (Cestari *et al.*, 2013; Pozzoli & Paolone, 2017, 3), which can be described as a downward spiral following Hambrick & D'Aveni (1988). Some empirical results confirm the presented assumptions. Altman *et al.* (2010) show a non-linear relationship between firm size and the probability of default. This can be explained by the results of Sehgal *et al.* (2021) and Yazdanfar & Öhman (2020) because scale inefficiencies arise above a certain firm size, which, in turn, increases the probability of default. Furthermore, it is more difficult for managers to manage the company efficiently above a certain company size (Glancey, 1998). Thus, a critical point is reached at which the performance of the company starts to decline again (Serrasqueiro & Nunes, 2010). An influence of possible non-linear behavior of company size and age regarding the probability of financial distress has not been studied for the tourism industry. Based on the explanations and the results of previous studies, the following two research hypotheses were formulated.

H3: There is a significant non-linear relationship between the size of hotels and restaurants and the likelihood of financial distress.

H4: There is a significant non-linear relationship between the age of hotels and restaurants and the likelihood of financial distress.

The RBV is also a helpful criterion to explain the diversification efforts of companies (Hauschild & zu Knyphausen-Aufseß, 2013). Diversification can only be implemented if the excess capacity of resources is available (Peteraf, 1993). Murphy & Tocher (2017) state that this seems possible for larger companies and that smaller companies do not have the resources outlined earlier due to their smaller size. Thus, a link is evident between RBV and the ability to diversify (Chatterjee & Wernerfelt, 1991). Wilson (1992) describes that diversification can lead to augmented market power, resulting in strategic and tactical advantages. Besides this aspect, diversification also serves to reduce cash flow variances (Pearce & Michael, 1996) so that the firm-specific risk can be reduced (Everett & Watson, 1998).

Dawley *et al.* (2003) and Ben-Zion & Shalit (1975) explain that no clear statement can be made about which type of diversification (related or unrelated) can best be used to reduce business risk. Nevertheless, based on the study results of Sheppard (1994), it can be concluded that diversification is not a guarantee for a firm's survival but an important basis to protect against different threats (Morris *et al.*, 2006). The extent to which diversification may have a risk-reducing effect (in terms of firm-specific risk) on tourism firms has not been analyzed in previous studies. Based on the previously outlined findings, the following research hypothesis was therefore formulated.

H5: Diversified hotels and restaurants have a lower probability of financial distress.

3.2. Network-based-view (NBV)

Here, the environment of a company is seen as a network in which each company influences other companies and vice versa (Thorelli, 1986). This aspect is particularly relevant for tourism businesses because they are embedded in regions or destinations and thus operate in a highly dynamic and challenging environment that can increase or improve competitive advantage (Duncan *et al.*, 1998; Porter, 1999). In this context, Enright & Newton (2004) showed that the competitiveness of the destination is one of the most important success factors for tourism businesses. Thus, the joint consideration of firm-specific factors and destination factors appears relevant to describe or capture the success of tourism businesses.

In a study, Andersson *et al.* (2002) stated that the probability of survival of a company increases with the formation of networks. Consequently, companies in a group of companies can be more successful than stand-alone companies if they succeed in strengthening their relationship to share their resources (Lavie, 2006). This is an economic advantage that can strengthen the stability of a company and lead to a reduction in the probability of insolvency (Claessens *et al.*, 2003; Dewaelheyns & van Hulle, 2006) because there is a more stable and secure environment, thereby enabling risk reduction (Andersson *et al.*, 2002; Gulati *et al.*, 2000). Parsa *et al.* (2005) state that small companies and companies that are not embedded in a restaurant chain show higher failure rates. Based on these considerations, the following research hypothesis can be derived.

H6: Hotels and restaurants that are embedded in a group of companies have a significantly lower probability of financial distress.

The relevance of the location and its influence on the failure rates of restaurants could be documented by Parsa *et al.* (2005), Parsa *et al.* (2011), and Parsa *et al.* (2015). In this context, Andreano *et al.* (2018) and Platt & Platt (2008) generally state that the location of a company influences the probability of default. In the study by Andreano *et al.* (2018), the probability of solvency is three times higher when similar solvent companies are located in the neighborhood. Regions with high growth tend to be home to firms with a high stock of network capital, which provides access to economically beneficial

knowledge and innovation (Audretsch & Dohse, 2007; Huggins & Thompson, 2015, 2014). The results of Parsa *et al.* (2005) are divergent for independent and chain restaurants because they were able to show that restaurant failures are highest when there is a high concentration of restaurants in a ZIP-code area. Thus, the location of the business plays an important role in how well it has access to a wide variety of networks (Porter, 1991; Williams, 2014b), which is particularly relevant for the tourism industry (Wilson *et al.*, 2001).

It is a relevant strategic factor in the tourism industry (Vivel-Búa & Lado-Sestayo, 2021). Specifically, if access to networks is weak, the probability of default increases (Williams, 2014a). Tsai *et al.* (2009) indicate that a destination can be considered competitive if it can attract and satisfy potential tourists. The size of networks and access to resources is generally lower in rural regions than in urban regions. Thus, the following research hypothesis can be formulated.

H7: Hotels and restaurants located in urban areas have a significantly lower probability of financial distress.

4. Variables, Data base, and methodology

4.1. Variables of the study

The suitability of variables for inclusion in early warning systems should be such that risk drivers are used at the univariate level (Porath, 2011, 32). To be able to systematize these, the concept of Everett & Watson (1998) was used in this study, in which risks were divided into a.) systematic and unsystematic and b.) exogenous and endogenous risks. Thus, following Tsai *et al.* (2009), critical issues of tourism and hotel competitiveness, such as competitive forces of the industry, firm-specific level, and destination level, can also be captured. The classification of the variables used in the study is shown in Table 2.

Table 2. Classification of the variables of the studies according to risk type

Unsystematic		Systematic
Firm	Industry	Economy
<ul style="list-style-type: none"> • Independent variables describing the firm (firm-specific level) <ul style="list-style-type: none"> ▪ Financial statement ratios ▪ Size & age ▪ ONEG ▪ Diversification ▪ Affiliation ▪ Legal form • Independent variables on the location of the enterprise (destination level) <ul style="list-style-type: none"> ▪ Urban-rural typology ▪ Criterion tourism destination ▪ Permanent settle area per district 	<ul style="list-style-type: none"> • Independent variables describing the industry (forces of the industry) <ul style="list-style-type: none"> ▪ Main industry ▪ Industry-related profitability ▪ Average length of stay ▪ Change in tourism intensity per inhabitants 	<ul style="list-style-type: none"> • Independent variables describing the national economy (national economy level) <ul style="list-style-type: none"> ▪ Inflation rate ▪ Change in gross domestic product ▪ Unemployment rate ▪ Gross investment in fixed assets ▪ Gross regional product
Endogenous		Exogenous

4.1.1. Dependent variable

The tourism businesses in this study were divided into two dichotomous groups, which were modeled as dummy variables (0 = non-financially distressed; 1 = financially distressed). Pretorius (2008, 2009) determines that the financial and economic state of a company cannot be determined objectively. Financial distress is a general term because there are several series of financial events which reflect the stages of corporate adversity (Turetsky & McEwen, 2001). However, it is an unobservable continuum or

dynamic process in which different degrees of severity of financial distress may be present (Kahl, 2002). The term financial distress is not specified in the literature (Keasey & Watson, 1991; Pozzoli & Paolone, 2017, 5; Situm, 2016), but different indicators can be found to describe this condition. In this study, financial distress was assumed when one or both of the present events occurred in a reporting year, which is a similar approach to that used by Poston *et al.* (1994).

1. negative cash flow (Anandarajan *et al.*, 2001; Ragab & Saleh, 2022; Turetsky & McEwen, 2001)
2. negative earnings (Gilbert *et al.*, 1990; Ragab & Saleh, 2022)

4.1.2 Endogenous unsystematic risk drivers

4.1.2.1 Firm-specific level.

In this context, variables from financial statement analysis were primarily used because they are suitable for describing company-specific risk (Beaver *et al.*, 1970). Even though such ratios do not necessarily allow a dynamic view of a company's development (Johnson, 1970), quite a few studies show that they are particularly suitable for leader identification and corporate crises and insolvencies (Hensher *et al.*, 2007; Turetsky & McEwen, 2001; Vivel-Búa *et al.*, 2016). Thus, they contain useful and timely information for investors (El Hennawy & Morris, 1983; Lev & Ohlson, 1982) so that a distinction can be made between weak and well-performing companies (Hensher *et al.*, 2007; Piotroski, 2000).

Table 3. *Independent variables (ratios) of the financial statement analysis*

Factor	Code	Name of the variable	Computation	References
Size	SIZE	Size of the firm	Log(Total assets)	Belda & Cabrer-Borrás (2021); Parsa <i>et al.</i> (2011)
Age	AGE	Age of the firm	Log(span between current and establishment year)	Abidin <i>et al.</i> (2021); Axioglou & Christodoulakis (2021); Belda & Cabrer-Borrás (2021)
Capital turnover & liquidity	CA_TA	Current assets turnover	Short-term assets / Total assets	Barniv & Raveh, 1998; Beaver, 1968
	WC_TA	Working capital turnover	Working Capital / Total assets	Barreda <i>et al.</i> (2017); Diakomihalis (2012); Park & Hancer (2012)
Profitability	EBIT_TA	EBIT profitability	EBIT / Total assets	Becerra-Vicario <i>et al.</i> (2010); Diakomihalis (2012)
	EBT_TA	EBT profitability	EBT / Total assets	Axioglou & Christodoulakis (2021)
	NI_TA	Adjusted net income profitability	Net income after extraordinary items/Total assets	Abidin <i>et al.</i> (2021); Becerra-Vicario <i>et al.</i> (2010); Youn & Gu (2010)
Capital structure	TE_TA	Equity ratio	Total equity / Total assets	Grunert <i>et al.</i> , 2005
	TD_TA	Debt ratio	Total debt/Total assets	Gu & Gao (2000), Gu (2000); Kim & Gu (2006)

In this context, Holder-Webb & Cohen (2007) state that financial distress can be detected using figures from financial statement analysis. Thus, their inclusion as early detection variables is justified. A compilation of the variables used in this study can be found in *Table 3*. The individual variables were grouped by factors based on the results of Chen & Shimerda (1981) and Pohlman & Hollinger (1981). The variables SIZE and AGE were logarithmized to reduce extreme variability and asymmetry in the annual cross-sectional distribution of data and to bring the data closer to normalization (Axioglou &

Christodoulakis, 2021; Löffler & Posch, 2007, 18). Based on the financial statement figures, the variable ONEG was introduced following Ohlson (1980), which takes the value of 1 when the company's debt is higher than its assets (balance sheet total) and 0 when it is not. He describes this variable as discontinuity correction of the variable total liability to total assets, and it can be detected if a company has a negative book value. The relevance of this variable for this study seems evident in the results of Chen (2013) and Upneja & Dalbor (2001), which showed that insolvent tourism businesses use more liabilities and that increasing leverage increases risk, respectively.

Two variants were used to model the diversification of tourism businesses. There are findings on the relationship between diversification and the probability of default or insolvency in general, but not for tourism businesses in particular. Based on the discussion of RBV, it can be assumed that diversified firms have lower unsystematic risk (Aaker & Jacobson, 1987; Rumelt, 1982) and therefore have a lower probability of insolvency (Dawley *et al.*, 2003). The initial coverage of the different types of diversification is based on dummy variables and was defined as follows:

1. Related diversification (1 = if an enterprise is engaged in a major and a minor activity, each in sub-codes I.55 or I.56; 0 = otherwise)
2. Unrelated diversification I (1 = if an enterprise is engaged in a major and a minor industry, where the major and minor industries can each be assigned one of two sub-codes I.55 or I.56; 0 = otherwise)
3. Unrelated diversification II (1 = if an enterprise is engaged in a major and a minor industry, but the secondary business is not covered by I.55 or I.56; 0 = otherwise)

Table 4. Effect-coding for the different types of diversification

	Effect-coding I (DIV_EFF1)	Effect-coding II (DIV_EFF2)	Effect-coding III (DIV_EFF3)
Related diversification	1	0	0
Unrelated diversification I	0	1	0
Unrelated diversification II	0	0	1
No diversification	-1	-1	-1

In the second variant, effect coding based on the previous definitions was used (Hardy & Reynolds, 2009, 211), which is presented in *Table 4*. The defined variables are related to the fifth research hypothesis. To capture the embeddedness of a company in a group of companies, a dummy variable (1 = belonging to a group of companies; 0 = otherwise) was defined, as also applied in the studies by Balcaen *et al.* (2011) or Gemar *et al.* (2019). Dewalheyns & van Hulle (2006) and Claessens *et al.* (2003) generally confirm that companies that are integrated into a group of companies have a lower probability of insolvency. For restaurants, Parsa *et al.* (2011) show that restaurants with affiliation have a higher probability of survival. Based on the present results, it can be assumed that the presence of affiliation leads to a reduction in the probability of financial distress.

The last variable included was the form of the company (LEG_FORM), which was modeled as a dummy variable (1 = corporation; 0 = partnership). Based on Harhoff *et al.* (1998) and Laitinen (2012), it can be concluded that the probability of insolvency is higher for corporations than for partnerships. Corporations have limited liability from a legal perspective. Thus, managers of these types of companies invest in riskier projects (Stiglitz & Weiss, 1981), which increases the risk of failure (Anders & Szczesny, 1998).

4.1.2.2. Destination level.

To capture the influence of the location, the regions were divided into URBAN_1 (cities and centers), URBAN_2 (cities and suburbs), and RURAL (sparsely populated) based on the urban-rural typology of Statistics Austria (Statistik Austria, 2021), each modeled as dummy variables. Subsequently, this classification was modeled using effect-coding and contrast-coding (Hardy & Reynolds, 2009, 211), which are shown in Table 5.

Table 5. Effect and contrast-coding for urban-rural classification

	Effect-coding I (URBRUR_EFF1)	Effect-coding II (URBRUR_EFF2)
URBAN_1	1	0
URBAN_2	0	1
RURAL	-1	-1
	Contrast-coding I (URBRUR_CON1)	Contrast-coding II (URBRUR_CON2)
URBAN_1	1	1/2
URBAN_2	1/2	1
RURAL	- 1/2	- 1/2

Such a classification has not been done in this form in previous studies, and therefore, two variants of modeling were used to test which of the two forms can better capture the influence of location on the probability of financial distress. In addition to the urban-rural typology, the size of the permanent settlement area per district in square kilometers (logarithm was used to normalize the data) was also included as a variable (PERM_SETT). This was done to measure the influence of the size of a district in which tourism businesses are located on the probability of financial distress. The possibility of a business interacting with the region (district) can be considered a surrogate for capturing labor market potential, which is essential for the survival and/or growth of businesses (Aalbers *et al.*, 2019). Similar to the age and size of the business, a quadratic term was attempted in the regressions because it can be assumed that a business cannot claim the full potential of labor resources.

Based on the urban-rural typology in Austria, certain municipalities in Austria are recorded with the additional criterion of tourism. This is the case when tourism is of above-average importance in a municipality and is measured by overnight stays and overnight stays per capita (Statistik Austria, 2021). The additional criterion was modeled as a dummy variable (TOURISM) (1 = municipalities that have this additional criterion; 0 = otherwise). The only study that used a similar variable for the analysis of hotel bankruptcies was conducted by Gemar *et al.* (2019). There, it was found that hotels in tourism regions were three times more likely to close. This can be explained by the increased degree of competition in such regions.

4.1.3. Exogenous unsystematic risk drivers: Forces of the industry

The affiliation of a company to its industry determines the extent to which the surrounding accessible inputs can be converted into outputs (Clegg *et al.*, 2017, 53). Fredland & Morris (1976) and Thornhill & Amit (2003) generally state that industry affiliation impacts the probability of insolvency or the probability of default of a company. Based on Koller *et al.* (2010, 60-61), this can be explained by the fact that the industry structure influences competition and its intensity and the possible performance of companies. Consequently, the industry is a good proxy for measuring rivalry in the market (Martin, 2012).

In principle, the industry for the companies in this study is the tourism industry, which can, however, be subdivided into two sub-codes based on the illustrations in Table 6. To capture the possible effect

of the main industry on the probability of financial distress, two dummy variables were introduced, which were defined as follows:

1. IND_HOSP (1 = if a company operates in the main industry I.55.1; 0 = otherwise)
2. IND_REST (1 = if a company operates in the main industry I.56.1; 0 = otherwise)

Porter (1991) stated in this context that the competitive advantage of a company should not be considered independently from the competition of their industry. To measure how good the efficiency of a tourism business is in relation to the industry average, the key figure EBIT_TA_{ind} was introduced (calculated as the relation between the EBIT_TA of the tourism business to the median EBIT_TA of the tourism industry per observation year). The indicator shows whether a company operates more efficiently or inefficiently than the industry average. Dambolena & Khoury (1980) stated that profitability is a surrogate for measuring management efficiency. Moreover, tourism companies with a ratio value of more than 1 have a management efficiency above the industry average. In this context, it can be assumed that higher values lead to a reduction in the probability of financial distress.

For the individual states, the average length of stay (ALS) indicator was collected for each year of observation and added to the data set. It is defined as the number of nights divided by arrivals (Candela & Figini, 2012, 38). This variable was not included in previous studies. Here, the absolute number, the logarithmized number, and the relative change in ALS between two years were integrated to test its explanatory power. In this context, Candela & Figini (2012, 38, 111) state that this ratio is suitable to capture the tourist's movement, which can be considered as a relevant variable to describe the demands for tourist services. A low ratio or a reduction of it can be seen as an indication of the reduction in the number of overnight stays. Moreover, this decrease leads to a reduction in the total expenditure of tourists (Gomes de Menezes *et al.*, 2009, 101), which detracts the revenues of tourism businesses. In addition to the variable TOURISM, the variable CHG_TOURINT was used, which describes the change in tourism intensity in relation to the inhabitants in percent per federal state and per year of observation. It serves as an indicator of the change in tourism demand per federal state.

4.1.4. Exogenous systematic risk drivers: National economy variables

The dependence of demand for tourism on the development of underlying factors in the national economy has been demonstrated in several studies. Bleile (1983), for example, describes that the number of overnight stays in German domestic tourism correlates with the development of the gross national product in real terms (real GNP) with a time lag of up to one year. Furthermore, in the study of Gemar *et al.* (2019), the business cycle influences the survival probability of resort hotels. In a study of the Chinese hotel industry, Chen (2013) shows that the beta (risk) for this industry is higher than the market beta and that even small fluctuations in economic conditions can significantly impact the profitability of hotel operations. Pulido-Fernández & Cárdenas-García (2021), therefore, conclude that economic development determines the expansion of tourism activity.

Regardless of the industry, default probabilities have been found to fluctuate systematically with the business cycle (Bhattacharjee *et al.*, 2009; Manzanque *et al.*, 2015). Thus, it is recommended to integrate macroeconomic variables in the development of early warning systems (Keasey & Watson, 1991; Manzanque *et al.*, 2015) because insolvencies cannot be considered a pure financial phenomenon (Botazzi *et al.*, 2011; Fredland & Morris, 1976). The inflation rate in percent per year (INFL) was collected from official statistics, and also included in the studies of Acosta-González *et al.* (2019) and Butera & Faff (2006). Norton & Smith (1979) describe that annual inflation has a correlative relationship with financial statement analysis figures, which affects the stability and measurement accuracy of early detection models. It can be generally assumed that higher inflation rates lead to an increase in default

probabilities (Liu, 2009). The variable GDP_CHG describes the change in gross domestic product per year, which indirectly describes economic growth. Empirical evidence indicates that as GDP growth increases, the probability of insolvency decreases (Butera & Faff, 2006; Liou & Smith, 2007). The variable UNEMPL was used to include the annual percentage unemployment rate in Austria, following Acosta-González et al. (2019) and Butera & Faff (2006). Assaf & Josiassen (2012) state in this context that the unemployment rate is a negative determinant of tourism performance.

The problem with GDP is that it is measured for the entire country and, therefore, cannot capture the growth of individual federal states, in particular, in which the branches of the tourism businesses are located. Therefore, the change in the annual real gross regional product (CHG_GRP) was included for each province and each year of observation. As the last parameter, the annual percentage gross fixed capital formation (FIXED_INV) in the tourism industry per province and the year was included to estimate the willingness of businesses to invest. Based on Dritsakis & Athanasiadis (2000), increasing large investments in fixed assets leads to an increase in the number of tourists per population, which also means that the demand for tourism services can be increased. Following previous studies, it can be assumed that some of the selected variables have a time lag effect on the individual years of observation (e.g., Butera & Faff, 2006; Everett & Watson, 1998). Consequently, this aspect was also taken into account in the analyses.

4.1.2. Description of the data base

The data in this study include figures from the annual financial statements of Austrian companies in the tourism industry. To extract these companies from the Creditreform database, the industry code I (accommodation and food services) according to the Ö-NACE classification was used. The exact classification can be found in *Table 6*, with the focus in this study on sub-codes I.55.1 and I.56.1.

Table 6. General structure of industry code I (Accommodation and food service activities)

I 55 – Accommodation	I 56 - Food and beverage service activities
I 55.1 – Hotels and similar accommodation	I 56.1 – Restaurants and mobile food service activities
I 55.2 – Holiday and other short-stay accommodation	I 56.2 - Event catering and other food service activities
I 55.3 – Camping grounds, recreational vehicle parks and trailer parks	I 56.3 – Beverage serving activities
I 55.9 – Other accommodation	

The data collected after extraction were supplemented with data from other sources so that the variables presented in the study could be included (e.g., urban-rural typology of Statistics Austria [Statistik Austria, 2021], economic indicators of Statistics Austria, etc.). After the reduction process (eliminating companies from the database for which no data was available), 280 observations of financially distressed and 496 healthy (non-financially distressed) tourism businesses for the second period between 2005 and 2015 were finally obtained for the study as a sample, so that a longitudinal study was carried out (Ritchie, 2005, 131).

4.1.3. Methodology

The dependent variable (financial distress) was binary coded. Thus, logistic regression was used to answer the research questions and test the research hypotheses because it can directly calculate the probability regarding the membership of companies in one of the two groups (Burns & Burns, 2008, 568-569; Marques de Sá, 2007, 271). Logistic regression has become well-established in research and practice as a method for developing early (crisis) detection systems (Abdou & Pointon, 2011; Hayden, 2011, 13). In the analyses, multiple regressions based on the sequential method were computed to

determine whether the inclusion of additional variables could improve the model quality of the models (Foster *et al.*, 2006, 60).

The major advantages of logistic regression are its relative robustness of estimation despite deviation of the data from the normal distribution and the fact that there is no need for equality of the (co-)variance matrices. Subsequently, good and reliable model estimates can be obtained despite the presence of these circumstances (Pohar *et al.*, 2004). All regression estimates were supplemented by marginal effects calculations based on the delta method (calculation for the mean) to better assess the probability of the dependent variable changing when an independent variable changes (Gruszczynski, 2020, 32; Long & Cheng, 2009). This analysis appears to be useful since it is particularly well suited to better interpret nonlinear models or the change in their coefficients (Long & Cheng, 2009, 260).

Before calculating the individual regressions, preliminary analyses were performed according to a systematic approach recognized in the literature. In the first step, descriptive statistics, including tests for the normal distribution of the data, were calculated. These calculations were supplemented with a test for differences (parametric and non-parametric) to identify relevant risk drivers on a univariate level (Porath, 2011, 32). This was complemented by correlation and factor analyses to identify potential multicollinearities and information redundancies in the data (Anderson, 2007, 183). To avoid strong deviations of the year-end data from the normal distribution and thus potential influences on the regression estimates (Klecka, 1980, 63), the data in question were winsorized to the 1% level (99th and 1st-percentile) following Löffler & Posch (2007, 15-19).

5. Results

5.1. Descriptive and inferential statistics and risk drivers on a univariate basis

The summary of the data and statistics is presented in *Table. 7*. It can be concluded on a univariate level that financially distressed firms (all firms together, but also split into hotels and restaurants) are significantly smaller, have a significantly weaker liquidity situation, significantly lower profitability, and have higher debt and lower equity ratios than healthy firms. These results are consistent with the basic theoretical assumptions and also confirm general empirical theories concerning the tourism industry studies of crisis and insolvency early detection (e.g., Barreda *et al.*, 2017; Belda & Cabrer-Borrás, 2012; Gu & Gao, 2000; Kim & Gu, 2006; Kim, 2011, Parsa *et al.*, 2011, 2015).

The logistic regression estimate is sensitive to high correlations or multicollinearity between variables in the financial statement analysis. Consequently, a correlation and factor analysis were calculated (Burns & Burns, 2008, 836), which are presented in the appendix in *Table. A2-A4*. Based on Burns & Burns (2008, 386) and Kahane (2008, 122), multicollinearity can be assumed when a correlation of more than 0.8 is present. The results show that only between a few variables a potential multicollinearity can be assumed. Between the variables describing profitability (EBIT_TA, EBT_TA, and NI_TA), significant correlations of more than 0.7 are given. Factor analysis also shows that these three variables load on one factor. Thus, there are information redundancies between them. Due to these conditions, only one of the variables should be included in the regressions.

5.2. Multiple output models

To better analyze the effect of the individual variables on the explanation of financial distress, four models were calculated, which are shown in *Table. 8*. In all models, the variable SIZE has a significantly negative coefficient, indicating that larger firms have a lower probability of financial distress. This result confirms the "liability of smallness" assumption that smaller companies have a higher probability of insolvency or a higher mortality rate (Aldrich & Auster, 1986; Williams, 2014a). Accordingly, the greater

resources associated with firm size help reduce the risk of failure because inherent firm-specific risks can be reduced (Castanias, 1983). Thus, SIZE is a good indicator to describe past and future performance and risk of tourism companies (Ben-Zion & Shalit, 1975).

Table 7. Descriptive statistics on figures of the annual financial statement analysis

Variable	Statistic	All firms (n = 776)		Hotel firms (n = 466)		Restaurant firms (n = 310)	
		healthy (n = 496)	financially distressed (n = 280)	healthy (n = 304)	financially distressed (n = 162)	healthy (n = 192)	financially distressed (n = 118)
SIZE	Median	7.054	6.782	7.181	6.954	6.886	5.932
	Z-value	-7.870***		-4.344***		-7.687***	
	Mean	6.986	6.363	7.115	6.844	6.781	5.703
	T-value	8.870***		4.526***		8.939***	
AGE	Median	1.297	1.275	1.351	1.294	1.212	1.255
	Z-value	-0.165		-1.599		-2.182**	
	Mean	1.291	1.311	1.340	1.265	1.214	1.374
	T-value	-2.374**		1.695 [†]		-3.426***	
CA_TA	Median	0.370	0.230	0.235	0.140	0.550	0.380
	Z-value	-1.534		-1.178		-0.970	
	Mean	0.403	0.381	0.322	0.300	0.532	0.491
	T-value	0.939		0.789		1.049	
WC_TA	Median	0.010	0.000	0.010	0.000	0.020	0.000
	Z-value	-5.476***		-3.195***		-4.624***	
	Mean	0.042	-0.007	0.032	0.013	0.058	-0.034
	T-value	5.206***		2.486**		4.572***	
EBIT_TA	Median	0.070	-0.020	0.060	-0.010	0.090	-0.055
	Z-value	-12.217***		-10.190***		-7.202***	
	Mean	0.105	-0.078	0.095	-0.032	0.121	-0.140
	T-value	7.146***		4.689***		5.087***	
EBT_TA	Median	0.060	-0.050	0.055	-0.030	0.080	-0.080
	Z-value	-14.293***		-12.068***		-8.191***	
	Mean	0.097	-0.094	0.074	-0.059	0.133	-0.142
	T-value	10.110***		10.181***		6.750***	
NL_TA	Median	0.050	-0.050	0.050	-0.045	0.070	-0.085
	Z-value	-14.430***		-11.868***		-8.560***	
	Mean	0.080	-0.113	0.061	-0.060	0.111	-0.185
	T-value	9.206***		9.068***		6.492***	
TE_TA	Median	0.340	0.005	0.385	0.095	0.260	-0.110
	Z-value	-14.288***		-10.198***		-10.733***	
	Mean	0.366	-0.970	0.403	-0.059	0.307	-2.221
	T-value	5.548***		6.511***		4.652***	
TD_TA	Median	0.660	0.995	0.615	0.905	0.740	1.110
	Z-value	-14.288***		-10.198***		-10.733***	
	Mean	0.634	1.970	0.597	1.059	0.693	3.221
	T-value	-5.548***		-6.511***		-4.652***	

Notes: The table first shows the medians and the Z-values based on the U-test (non-parametric test for differences), since the data do not show a normal distribution. Further on, the mean values and the corresponding T-values (parametric test for differences) are shown. Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent.

The significant positive coefficient on the variable SIZE² indicates a non-linear relationship between firm size and the probability of financial distress. This is consistent with the results of Altman et al. (2010) and Forgione & Migliardo (2019), which showed a non-linear relationship between firm size and the probability of insolvency or corporate failure. In this context, Nunes et al. (2010) and Serrasqueiro & Nunes (2008) argue that profitability increases linearly and subsequently decreases after a certain

point. Examining the correlative relationships, it is visible that SIZE and EBIT_TA have a slightly stronger positive relationship with each other ($\rho = 0.265$; sign. = 0.000) than SIZE² and EBIT_TA ($\rho = 0.245$; sign. = 0.000), which partly supports the previous statement. A significant cubic term could not be detected for the variable SIZE. This approach is recommended by Haans *et al.* (2016) to check the robustness of the results.

There are no significant coefficients for the variables AGE and AGE². Thus, the influence on the probability of financial distress cannot be proven. Thus, the assumption of "liability of age" for tourism enterprises cannot be confirmed. This is in contrast to the statements of Jovanovic & MacDonald (1994) and Kücher *et al.* (2020) that older companies use their resources better, thus innovate better and possess a competitive advantage. In this context, it is also questionable whether age is a good proxy for describing a company's skills and resources, as elaborated by Cerrato & Piva (2012).

The figures of the financial statement analysis show almost all (except CA_TA) negatively significant coefficients, which is in line with the unanimous opinion of the literature that these are suitable for the early detection of (financial) distress (Holder-Webb & Cohen, 2007). Tourism businesses that have higher working capital (WC_TA), higher profitability (EBIT_TA), and higher equity ratio (TE_TA) have a lower probability of financial distress. Based on the size of the coefficients of the logistic regression functions and the coefficients of the analysis of the marginal effects (*Table. A5*), it is evident that these ratios have a high contribution to explaining the dependent variable.

Profit margin can be considered as a proxy to measure management efficiency (Dambolena & Khoury, 1980; Hua *et al.*, 2013). The negative signs of the coefficients in the ratio EBIT_TA indicate that management is more inefficient in financially distressed companies, which, based on Whitaker (1999), is the main reason for the distress condition. The ratio WC_TA can be interpreted to describe the ability to pay debts (Philosophov *et al.*, 2008). Distressed firms have fewer assets compared with short-term debt (mainly by the increase in trade credit and short-term bank liabilities), which can explain the lower working capital (Beaver, 1968; Chatterjee *et al.*, 1996). Based on the correlations (*Table. A2*), a positive significant relationship is evident between the equity ratio and the ratios describing profitability, indicating that tourism businesses tend to finance themselves following the pecking-order theory (Drobtz & Wanzenried, 2006; Frank & Goyal, 2009).

In this context, as expected from the descriptive analyses, the variable ONEG shows significant positive coefficients, which means that tourism businesses with a negative book value have a higher probability of financial distress. Ohlson (1980) describes this variable as discontinuity correction of the variable total liability, and based on Deeg (2009) if the crisis evolution process can be described as discontinuity, ONEG seems to capture this discontinuity well. Based on Chen (2013) and Upneja & Dalbor (2001), the increase in leverage can be seen as an increase in corporate risk, which also leads to an increase in the probability of financial distress.

For the variables capturing diversification, REL_DIV and UNREL_DIV₂ show negative significant coefficients. This means that diversification leads to a reduction in the probability of financial distress. Diversified firms appear to have lower risk, or diversification leads to a reduction in firm-specific risk (Aaker & Jacobson, 1987; Dawley *et al.*, 2003). This result is consistent with the RBV, as related diversification (REL_DIV) can be used from a business perspective to exploit economies of scope so that existing assets can be used efficiently, leading to an improvement in profitability (Agnihotri, 2014; Chen *et al.*, 2014) and consequently, leading to a reduction in firm-specific risk (La Rocca *et al.*, 2009). Tourism

businesses that are also active in a secondary industry outside the tourism industry (UNREL_DIV₂) also show a lower significant risk of financial distress.

The legal form (LEG_FORM) appears relevant based on the results because the probability of financial distress increases when the firm is a corporation. This finding underlines the results of Harhoff *et al.* (1998) and Laitinen (2012), who report that the probability of insolvency is higher for corporations than for partnerships. Applied to the tourism industry, this indicates that entrepreneurs of corporations are more likely to take more risks, thus increasing the risk of failure (Anders & Szczesny, 1998; Stiglitz & Weiss, 1982). A significant influence of the variable AFFIL on the dependent variable could not be shown. Nevertheless, the coefficient shows a negative sign, indicating that tourism businesses that are integrated into business groups have a lower probability of financial distress.

Regarding the location of the company, the variable URBAN₂ has a statistically significant and negative coefficient. This means that companies in cities and suburbs have a lower probability of financial distress. A regression using effect-coding confirms this result and indicates that firms in URBAN₂ regions have a lower probability than firms in rural areas. A significant effect of URBAN₁ could not be detected. The location of the business plays a role in how good the access to resources (networks and knowledge) is (Audretsch & Dohse, 2007; Porter, 1991; Williams, 2014b) and also highlights this importance for the tourism industry (Wilson *et al.*, 2001). The other variables measuring the influence of location did not show significant results.

The forces of the industry only show that hotels have a higher probability of financial distress than restaurants. This supports the findings of Koller *et al.* (2010, 60-61) that the structure of the industry impacts firm performance. Accordingly, belonging to a particular industry impacts the probability of crisis (Fredland & Morris, 1976; Hol, 2007). The inclusion of industry forces leads to a small but obvious increase in model quality and classification accuracy. Thus, following Chava & Jarrow (2004), it can be concluded that industry effects influence the early detection of crises.

The variable EBIT_TA_{ind} is not found in the present regressions. However, it was also tested and found to have significantly negative coefficients but cannot be included in a regression together with the variable EBIT_TA, as there is a highly positive correlative entanglement ($\rho = 0.981$; Sign. = 0.000). Tourism businesses that generate a higher EBIT_TA compared to the industry median can thus reduce the probability of financial distress.

Finally, variables describing the national economy level showed no influence in explaining the dependent variables. After several combinations and regressions, the variable FIXED_INV_LAG₁ was included in models III and IV, and its sign corresponds to theoretical expectations. However, its explanatory influence remains statistically insignificant. The basic assumption was that certain variables (exogenous systematic risk drivers) influence the probability of financial distress, but this could not be demonstrated in this study. Instead, the study confirms the findings of Nermuth (1983), who found for Austria that the influence of business cycles cannot provide an adequate explanation for the number of insolvencies.

In conclusion, financial statement ratios occupy a dominant position in explaining financial distress in tourism firms, as reported in previous studies of crisis and insolvency early warning (e.g., Beaver *et al.*, 2005; Hensher *et al.*, 2007). This confirms that the success of the firm depends more on strategic decisions at the firm-specific level or more on internal factors and less on industry conditions (Parsa *et al.*, 2005; Spanos *et al.*, 2004). This can be seen from the calculated characteristic values AUC and Gini-

coefficient. Since all values have a Gini-coefficient of more than 70%, high classification accuracy can be assumed (Anderson, 2007, 205). By adding the industry forces (Model II), a small improvement could be achieved. However, by integrating the variables describing the national economy, no improvement in model quality could be achieved (Jones, 2017).

Table 8. Logistic regressions systematized by main risk categories: All companies

Variable	Model I		Model II		Model III		Model IV	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
<i>Firm-specific level:</i>								
SIZE	-7.618***	2.394	-7.741***	2.443	-7.637***	2.398	-7.750***	2.446
SIZE ²	0.551***	0.187	0.551***	0.191	0.552***	0.187	0.551***	0.191
AGE	0.099	1.147	-0.147	1.168	0.106	1.148	-0.143	1.170
AGE ²	-0.275	0.461	-0.189	0.469	-0.278	0.461	-0.190	0.470
CA_TA	0.211	0.450	0.434	0.469	0.210	0.450	0.434	0.469
WC_TA	-3.221***	1.183	-3.229***	1.224	-3.220***	1.183	-3.228***	1.224
EBIT_TA	-8.549***	1.198	-8.186***	1.207	-8.556***	1.199	-8.189***	1.208
TE_TA	-3.201***	0.574	-3.578***	0.606	-3.200***	0.574	-3.577***	0.606
ONEG	2.753***	0.587	2.770***	0.602	2.753***	0.587	2.770***	0.602
REL_DIV	-1.227**	0.538	-0.788	0.578	-1.221**	0.538	-0.786	0.579
UNREL_DIV1	0.070	0.311	-0.034	0.321	0.068	0.311	-0.035	0.321
UNREL_DIV2	-0.839**	0.373	-0.704*	0.378	-0.841**	0.373	-0.704*	0.378
AFFIL	-0.284	0.334	-0.418	0.336	-0.280	0.335	-0.416	0.337
LEG_FORM	2.555***	0.516	2.708***	0.529	2.555***	0.516	2.707***	0.529
<i>Destination level:</i>								
URBAN_1	-0.426	0.431	-0.470	0.538	-0.419	0.434	-0.465	0.542
URBAN_2	-1.926***	0.515	-1.712**	0.518	-1.926***	0.516	-1.712**	0.518
TOURISM	-0.541	0.462	-0.735	0.503	-0.537	0.463	-0.734	0.503
PERM_SETT	0.511	0.511	0.513	0.825	0.518	0.513	0.519	0.828
<i>Industry forces:</i>								
IND_HOSP			0.878***	0.306			0.877***	0.306
ALS			-0.061	0.311			-0.060	0.311
CHG_TOURINT			0.158	1.459			0.137	1.490
<i>National economy level:</i>								
FIXED_INV_LAG1					-0.107	0.626	-0.046	0.644
CONSTANT	24.009***	7.960	24.620***	8.457	24.054***	7.969	24.632***	8.460
Chi-Square	5.648		7.100		5.623		6.524	
R ² (Nagelkerke)	0.644		0.652		0.644		0.652	
α- Error [%]	31.071		28.571		31.071		28.571	
β- Error [%]	7.056		7.056		7.056		7.056	
Accuracy [%]	84.300		85.180		84.278		85.180	
AUC	0.915***	0.010	0.918***	0.010	0.915***	0.010	0.918***	0.010
Gini-coefficient	0.830		0.835		0.830		0.835	

Notes: The dependent variable financial distress was binary coded. (0 = healthy company; 1 = financially distressed company). χ^2 -tests and Nagelkerke's R² were calculated to assess the model qualities (Burns & Burns, 2008, 579-580). To determine the classification accuracy of the models, the α -error (a financially distressed company is classified as healthy), the β -error (a healthy company is classified as financially distressed), and the accuracy (percentage of those companies that were classified into the correct group based on the model) were calculated from a confusion matrix (Fawcett, 2006; Metz, 1978). These measures were supplemented by the AUC and the Gini-coefficient (Abdou & Pointon, 2011). The cut-off point with respect to assignment to one of the two groups is 0.5. Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 776 observations (group 0: 496; group 1: 280).

5.3. Robustness tests

To check the robustness of the previous estimation results, the logistic regressions were calculated again, including models for hotels (*Table. 9*) and restaurants (*Table. 10*). The influence of firm size (SIZE) remains significant even when considering the two sub-industries, in the sense that the probability of financial distress decreases with increasing size. A similar result was shown by Belda & Cabrer-Borrás (2021), Chen (2013), and Parsa *et al.* (2015) for hospitality firms and by Parsa *et al.* (2005, 2011) for restaurants for the state's failure and survival. Thus, the assumptions of the RBV that larger (tourism) firms have a competitive advantage can be confirmed (Jovanovic & MacDonald, 1994). Based on the results of the correlation analyses in *Table. A3* and *A4*, larger companies have higher profitability (and thus more efficiency). A similar result could also be shown by Alberca & Parte (2018) for restaurants and by Fernández & Becerra (2015) for hotels. Large tourism firms have more resources (Peteraf, 1993), and therefore, they can innovate better, leading to higher efficiency (Jovanovic & MacDonald, 1994).

A significant influence of SIZE² is only given for restaurants. Thus, the results of the previous analyses cannot be confirmed. Accordingly, it depends on the industry in which a tourism business operates. A look at the correlations shows that for both sub-industries, there is a reduction in profitability (measured by EBIT_TA) with increasing quadratic firm size. This reduction is larger for restaurants (SIZE vs. EBIT_TA - $\rho = 0.381$; Sign. = 0.000 / SIZE² vs. EBIT_TA - $\rho = 0.356$; Sign. = 0.000) than for hotels (SIZE vs. EBIT_TA - $\rho = 0.094$; Sign. = 0.042 / SIZE² vs. EBIT_TA - $\rho = 0.091$; Sign. = 0.051). Following Serrasqueiro & Nunes (2008), this result implies that for restaurants above a certain firm size, a critical point is reached at which performance declines again, resulting in scale inefficiencies, leading to an increase in the probability of financial distress (Yazdanfar & Öhman, 2020).

Age is only relevant for hotels, and this indicates that older hotels have a lower probability of financial distress. This can be explained by the fact that for hotels, there is a positive and significant correlative relationship between SIZE and AGE ($\rho = 0.149$; Sign. = 0.001), while for restaurants, there is a negative relationship between these two variables ($\rho = -0.272$; Sign. = 0.000). This is consistent with Abidin *et al.* (2021), who showed that the probability of failure decreases with age. Belda & Cabrer-Borrás (2021) also show that the survival rate increases with age. Similar to the two regressions for all companies, no significant non-linear relationship to AGE² was found in the regressions for the sub-industries.

Figures from the financial statement analysis remain the dominant explanatory variables even when the two sub-industries are separated, as can be seen from the regression coefficients and the coefficients of the analyses of the marginal effects (*Table. A6* and *A7*). In general, higher profitability (EBIT_TA) and a higher equity ratio (TE_TA) (and thus implicitly a lower leverage ratio) lead to a reduction in the probability of financial distress. These results are consistent with those of Fernández-Gómez *et al.* (2016), Diakomihalis (2012), Kim (2018), and Park & Hancer (2012) for hospitality firms and Barreda *et al.* (2017), Becerra-Vicario *et al.* (2020), and Gu (2007) for restaurants. Over-indebtedness (ONEG) impacts the probability of financial distress for both sub-branches. This confirms the general view that an increase in debt leads to an increase in risk for tourism firms (Abidin *et al.*, 2021; Axioglou & Christoulakis, 2021; Upneja & Dalbor, 2001).

The variable WC_TA did not show significant coefficients in any of the models, which does not support the robustness of the estimates from *Table. 8*. This result contrasts with the findings of Diakomihalis (2012), Gemar *et al.* (2019), and Park & Hancer (2012) for hospitality firms and Barreda *et al.* (2017) for restaurant firms. For restaurants, the variable CA_TA shows a significant positive coefficient. Consequently, an excessive number of current assets relative to total assets leads to an increase in the probability of financial distress. This result is in line with the findings of Beaver (1968), who showed

that failed firms have higher inventory and accounts receivable compared to non-failed firms. A similar result was found by Kahya & Theodossiou (1999) for financially distressed firms.

Table 9. Logistic regressions systematized by main risk categories: Hotel firms

Variable	Model I		Model II		Model III		Model IV	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
<i>Firm-specific level:</i>								
SIZE	-0.569*	0.296	-0.645**	0.307	-0.568*	0.297	-0.639**	0.307
SIZE ²	-	-	-	-	-	-	-	-
AGE	-0.803**	0.374	-0.792**	0.378	-0.817**	0.377	-0.802**	0.379
AGE ²	-	-	-	-	-	-	-	-
CA_TA	0.184	0.616	-0.117	0.643	0.192	0.617	-0.091	0.644
WC_TA	-3.297	2.263	-3.125	2.349	-3.142	2.272	-3.022	2.347
EBIT_TA	-11.106***	1.822	-11.126***	1.835	-11.084***	1.829	-11.109***	1.839
TE_TA	-4.161***	0.787	-3.942***	0.798	-4.185***	0.788	-3.981***	0.801
ONEG	1.546**	0.741	1.593**	0.744	1.537**	0.741	1.579**	0.744
REL_DIV	-1.698	2.005	-1.426	2.265	-1.860	2.070	-1.572	2.327
UNREL_DIV1	-0.452	0.375	-0.335	0.382	-0.458	0.377	-0.347	0.384
UNREL_DIV2	-0.732	0.486	-0.695	0.487	-0.734	0.489	-0.697	0.489
AFFIL	-0.451	0.404	-0.474	0.406	-0.480	0.408	-0.499	0.409
LEG_FORM	2.726***	0.614	2.761***	0.612	2.767***	0.617	2.793***	0.614
<i>Destination level:</i>								
URBAN_1	0.639	0.567	-0.232	0.779	0.662	0.570	-0.162	0.789
URBAN_2	-1.369**	0.685	-1.256*	0.692	-1.366**	0.686	-1.264*	0.694
TOURISM	-0.032	0.580	0.206	0.602	-0.016	0.581	0.203	0.602
PERM_SETT	0.642	0.624	-0.830	1.118	0.657	0.626	-0.729	1.130
<i>Industry forces:</i>								
ALS			-0.686	0.445			-0.643	0.449
CHG_TOURINT			0.871	1.910			0.773	1.946
<i>National economy level:</i>								
FIXED_INV_LAG1					-0.169	0.857	-0.071	0.876
SIZExCHG_GDP_LAG1					-0.906	0.946	-0.714	0.970
CONSTANT	2.066	2.225	8.653*	4.781	2.102	2.229	8.277*	4.819
Chi-Square	21.138***		12.301		13.201		8.782	
R ² (Nagelkerke)	0.622		0.626		0.623		0.627	
α- Error [%]	29.012		29.012		29.012		28.395	
β- Error [%]	7.895		7.566		7.566		7.895	
Accuracy [%]	84.764		84.979		84.979		84.979	
AUC	0.912***	0.014	0.913***	0.014	0.912***	0.014	0.913***	0.014
Gini-coefficient	0.823		0.827		0.825		0.827	

Notes: The structure of the table is based on the explanations in Tab. 8. The cut-off point for assignment to one of the two groups is 0.5. Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 466 observations (group 0: 304; group 1: 162)

Concerning the variables describing diversification, the results are different and not in line with the previous estimates. For hotels, diversification does not significantly reduce the probability of financial distress. These results support the statements of Sheppard (1994) that diversification does not guarantee a firm's survival but (due to the negative signs of the correlation coefficients) protects against the threat of financial distress (Morris *et al.*, 2006). For restaurants, the variable UNREL_DIV1 (when a restaurant is active in another industry of food and beverage service activities) shows a significant but positive coefficient, indicating that with this type of diversification, the probability of financial distress increases.

This is contrary to the assumption that diversification is risk-reducing (Everett & Watson, 1998). Based on McDougall & Round (1983) and Porter (1987), diversification may impose additional costs and constraints on a firm, which may explain the present result.

The legal form of the company also shows a positively significant coefficient when subdivided into the two groups of companies, which supports the previously explained statements that corporations have a higher risk than non-corporations. This result is contrary to the findings of Gemar *et al.* (2019), who report for resort hotels that corporations have a higher probability of survival. The given results can be seen as an extension to the results of Harhoff *et al.* (1998) and Laitinen (2012) and seem plausible with the assumptions of Anders & Szczesny (1998) and Stiglitz & Weiss (1981). The inclusion of a firm in a group shows significant results for restaurants (based on the marginal effects analyses - see Table. A 7), which are in line with the assumptions of the network-based view (Andersson *et al.*, 2002; Lavie, 2006) and also the results of Parsa *et al.* (2011) confirm that restaurants with an affiliation have a higher probability of survival. For hotels, non-significant coefficients are given, which are, however, negative. Thus, overall the affiliation of the tourism business in a business group reduces the probability of financial distress.

Table 10. Logistic regressions systematized by main risk categories: Restaurant firms

Variable	Model I		Model II		Model III	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
<i>Firm-specific level:</i>						
SIZE	-21,063 ^{***}	5,718	-21,051 ^{***}	5,703	-21,085 ^{***}	5,842
SIZE ²	1,547 ^{***}	0,438	1,547 ^{***}	0,437	1,548 ^{***}	0,446
AGE	1,052	0,665	1,069	0,668	1,053	0,670
AGE ²	-	-	-	-	-	-
CA_TA	2,048 ^{**}	0,995	2,128 ^{**}	1,010	2,047 ^{**}	0,997
WC_TA	-2,770	1,914	-2,877	1,916	-2,771	1,914
EBIT_TA	-7,885 ^{***}	2,456	-7,982 ^{***}	2,471	-7,887 ^{***}	2,459
TE_TA	-9,763 ^{***}	2,454	-9,707 ^{***}	2,437	-9,774 ^{***}	2,527
ONEG	4,325 ^{***}	1,608	4,524 ^{***}	1,690	4,324 ^{***}	1,610
REL_DIV	0,393	0,920	0,368	0,922	0,394	0,920
UNREL_DIV1	3,547 ^{***}	1,133	3,533 ^{***}	1,135	3,549 ^{***}	1,139
UNREL_DIV2	-0,064	1,118	-0,088	1,132	-0,063	1,121
AFFIL	-1,302	0,795	-1,312	0,799	-1,300	0,802
LEG_FORM	6,106 ^{***}	1,862	6,177 ^{***}	1,897	6,111 ^{***}	1,886
<i>Destination level:</i>						
URBAN_1	-6,281 ^{***}	1,591	-6,234 ^{***}	1,607	-6,291 ^{***}	1,671
URBAN_2	-7,186 ^{***}	1,679	-7,226 ^{***}	1,693	-7,195 ^{***}	1,743
TOURISM	-2,666	2,043	-2,642	2,064	-2,673	2,072
PERM_SETT	-3,124 [*]	1,613	-3,044 [*]	1,621	-3,130 [*]	1,637
<i>Industry forces:</i>						
ALS			-	-		
CHG_TOURINT			-1,849	2,880		
<i>National economy level:</i>						
SIZExCHG_GRP_LAGo					-0,034	1,779
CONSTANT	77,514 ^{***}	21,063	77,141 ^{***}	21,017	77,610 ^{***}	21,671
Chi-Square	3.748		2.370		3.758	
R ² (Nagelkerke)	0.812		0.813		0.812	
α- Error [%]	4.167		3.646		4.167	
β- Error [%]	18.644		17.797		18.644	
Accuracy [%]	90.323		90.968		90.323	
AUC	0.969 ^{***}	0.008	0.970 ^{***}	0.008	0.969 ^{***}	0.008
Gini-coefficient	0.939		0.939		0.939	

Notes: The structure of the table is based on the explanations in Tab. 8. The cut-off point for assignment to one of the two groups is 0.5. Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 310 observations (group 0: 192; group 1: 118)

Regarding location, it is generally found to be relevant for tourism firms and to influence competitive advantage (Duncan *et al.*, 1998; Porter, 1999), which also supports the general considerations of the network-based view. Specifically, the probability of financial distress is reduced for hotels if they are located in cities and suburbs (URBAN_2), whereas for restaurants, being located in cities and centers (URBAN_1) is additionally statistically significant. Since the variables were defined as effect-coding, the location in these areas is significantly more advantageous than in rural areas. For restaurants, the variable PERM_SETT is statistically significant, and it establishes that the larger the district, the lower the probability of financial distress.

As in the previous regressions, no significant result was found for the exogenous systematic risk drivers. This supports the view already expressed that, following Nermuth (1983), the influence of business cycles in Austria cannot provide an adequate explanation for the number of insolvencies. The indicators used to assess the quality of the model show that all regressions (all Gini coefficients are above 0.7) have a high degree of classification accuracy (Andersson, 2007, 205). Overall, the significant estimates for most variables from the previous section remain robust even when differentiating between the two groups of companies. Therefore, it can also be concluded here that the success of hotels and restaurants is also more strongly attributable to internal factors (firm-specific level) (Parsa *et al.*, 2005; Spanos *et al.*, 2004).

6. Summary, conclusions and implications for tourism management

6.1. Summary and conclusions

The present study aimed to use various risk indicators to determine the extent to which it is possible to distinguish between financially distressed and healthy tourism businesses (specifically hotels and restaurants) and to identify the variables that have a significant influence on the probability of financial distress. The results confirm the basic statements of the RBV that companies with more resources have a higher probability of survival. Resources are measured by firm size, and this showed statistically negatively significant coefficients across all regressions, so the first research hypothesis can be considered fully valid. The results are also in line with previous studies that showed a similar linear relationship between firm size and the probability of financial distress, bankruptcy, etc., for restaurants (Parsa *et al.*, 2011, 2015) and hospitality firms (Belda & Cabrer-Borràs, 2021).

With regard to the age of tourism businesses, a negative significant sign was only found for hotels (Abidin *et al.*, 2021; Belda & Cabrer-Borràs, 2021). Thus, the second research hypothesis is valid for these businesses but must be rejected for restaurants. A quadratic term on firm size showed significant positive coefficients in the regression models for all firms and restaurants, supporting the third research hypothesis. This is a novel result not examined in previous studies. For restaurants, it appears that such firms cannot be managed efficiently above a certain firm size (Glancey, 1998), resulting in scale inefficiencies that increase the likelihood of financial distress (Sehgal *et al.*, 2021; Yazdanfar & Öhman, 2020). A quadratic term on the age of the firm could not be shown in any of the regressions, so the fourth research hypothesis can be considered falsified. This also represents a new finding, which could not be shown in previous research reports.

The results on the diversification of tourism firms show mixed results. For hotels, none of the variables showed statistically significant coefficients. Thus, the fifth research hypothesis is not valid for this group of companies. For restaurants, if these firms are also active in the accommodation industry (I.55.1), they can reduce their probability of financial distress. This means that unsystematic risk can be reduced (Aaker & Jacobson, 1987; Rumelt, 1982), and diversification can provide a basis to protect against different threats (Morris *et al.*, 2006). The findings obtained are an extension of current knowledge, as

previous studies have not examined the impact of diversification on the probability of survival of tourism businesses.

With regard to the affiliation of tourism businesses in a group of companies, no clear results could be determined. The affiliation shows a significant influence on the reduction of the probability (Parsa *et al.*, 2005, 2011) of financial distress only for restaurants, whereas this could not be shown for hotels. Thus, the sixth research hypothesis must be rejected for the latter group of firms. An exact reason for this unexpected result cannot be given based on the available literature. The embedding in a group of companies represents an economic advantage, which increases stability and thus also reduces the probability of insolvency (Claessens *et al.*, 2003; Dewaelheyns & van Hulle, 2006). This aspect does not seem to be fulfilled for hotels and gives rise to further research.

Finally, the location of restaurants and hotels impacts the likelihood of financial distress. This supports the general view that location is a strategic variable (Vivel-Búa & Lado-Sestayo, 2021), which is an important success factor for tourism firms (Enright & Newton, 2004). Thus, the results also support the seventh research hypothesis of this study. It can be inferred from all regressions that tourism firms located in urban regions (URBAN_2 – cities, and suburbs) have a lower probability of financial distress compared to rural-based firms. For restaurants, if they are located in cities and centers (URBAN_1), they also have a lower probability of financial distress compared to firms located in rural areas.

This result contrasts with Parsa *et al.* (2005), who show that a high concentration of restaurants in a ZIP-code area tends to increase the failure rate. Rather, it seems that it is not higher competition in a densely populated area that is crucial but the possible access to different networks (Porter, 1991; Wilson *et al.*, 2001). For restaurants, the larger the district, the lower the probability of financial distress. This can be argued to mean that firms can better interact with the district and thus take advantage of labor market potential, which increases the likelihood of survival (Aalbers *et al.*, 2019).

Based on the results, the main research question can be answered. As in previous studies, it can be concluded that figures from the analysis of annual financial statements make the greatest contribution to describing the probability of financial distress. They, therefore, possess information for describing firm-specific risk (Beaver *et al.*, 1970; Lev & Ohlson, 1982) so that they can distinguish between well-performing and poorly-performing firms (Hensher *et al.*, 2007; Piotroski, 2000).

In addition, the size of the company is another important variable that generally reduces the risk of tourism businesses. Overall, the success of the company depends more on strategic decisions on a company-specific level or more on internal factors and less on industry conditions (Parsa *et al.*, 2005; Spanos *et al.*, 2004). This also supports the general suitability of the RBV as a theoretical basis in the research of early crisis and insolvency detection for the tourism industry. Furthermore, it is also the destination level (urban-rural classification) that leads to improved early detection and thus supports the partial applicability of the NBV. Variables describing the industry forces and the national economy level did not show significant results.

6.2. Implications for tourism management

Based on the results of this study, concrete implications for tourism management can be derived. Essentially, both restaurants and hotels should optimize their efficiency and make efforts on the operational level (e.g., reducing costs, increasing sales, etc.) to increase profitability. A strategic orientation toward growth also seems relevant to build resources and reducing unsystematic risk. However, it should be noted for restaurants that the complexity of management increases above a

certain size (Glancey, 1998) and can lead to scale inefficiencies (Yazdanfar & Öhman, 2020). Thus, the introduction of management accounting is recommended (Situm *et al.*, 2021).

For restaurants, it is also advisable to optimize working capital management, focusing on inventory and receivables management to decrease the probability of financial distress (Amoa-Gyarteng, 2021; Farooq *et al.*, 2020; Habib & Kayani, 2022). Furthermore, professional financial management is generally required, and special attention should be paid to a balanced capital structure. The degree of indebtedness should be kept within limits, and over-indebtedness should be avoided. In the case of restaurants, consideration could be given to reducing the unsystematic risk through diversification, namely by positioning the firm in business areas of sub-sector I.55. The location (regions) of the firm should be strengthened by institutional investors. With regard to the location, the possibilities for establishing networks should be promoted at the institutional (political) level. In doing so, the competitiveness of the region should be strengthened (Enright & Newton, 2004) and growth enabled (Huggins & Thompson, 2015, 2014).

6.3. Limitations and recommendations for future research

Despite the careful implementation of the methodology and fulfillment of the prerequisites for the statistical analyses, this study is also not free of limitations. The results show similar findings as from previous studies. Thus, it can be assumed that the results have general validity and can, therefore, be transferred to other industrialized countries. A weakness can certainly be seen in the small number of observations, whereby more cases cannot be identified due to the available database. However, compared to many other studies, according to *Table. A1*, the number can be considered high and sufficient to obtain representative results.

The strength of the study lies in the fact that new variables were included that had not been used in earlier empirical work so that new insights could be gained. It is worth mentioning that other variables could have been included (especially variables describing the destination), which have the potential to explain the probability of financial distress. For example, due to a lack of data, management qualifications could not be modeled directly (management efficiency was approximated indirectly via profitability), but these are particularly relevant for explaining insolvencies.

Appendix

Table 1A. Summary of previous studies on early crisis and insolvency detection in the tourism industry

Author	Sample / time period	Country	Methodology	Variables	Main results
English (1996)	<ul style="list-style-type: none"> Different sample sizes for the different time periods 1990-1994 	USA	<ul style="list-style-type: none"> Descriptive statistics 	<ul style="list-style-type: none"> Initial investments Promotion expenditures 	<ul style="list-style-type: none"> Data show an inverse relationship between initial investment and success There is a positive relation between advertising and promotional campaigns and success
Gu & Gao (2000)	<ul style="list-style-type: none"> 14 hospitality firms filed bankruptcy under Chapter 11 matched with 14 non-bankrupt hospitality firms 1987-1996 	USA	<ul style="list-style-type: none"> Multivariate discriminant analysis (MDA) 	<ul style="list-style-type: none"> TL/TA EBIT/CL GP/S Long-term TL/TA S/FA 	<ul style="list-style-type: none"> Higher leverage and higher S/fixed assets increase the probability of bankruptcy Higher EBIT/CL, gross-profit-margin (GP/S) and long-term TL/TA reduce the probability of bankruptcy Unprofitable firms with high debt (especially with short-term-debt) are more likely to file for bankruptcy
Gu (2002)	<ul style="list-style-type: none"> 18 bankrupt and 18 non-bankruptcy restaurants 1986-1998 	USA	<ul style="list-style-type: none"> Multivariate discriminant analysis (MDA) 	<ul style="list-style-type: none"> TL/TA EBIT/TL 	<ul style="list-style-type: none"> Debt-burdened restaurants with poor EBIT are more likely to go into bankruptcy Restaurants with low Z-scores and high bankruptcy probabilities should adjust their growth strategy and financing policy
Parsa <i>et al.</i> (2005)	<ul style="list-style-type: none"> 2,439 failed independent and chain restaurants 1996-1999 	USA	<ul style="list-style-type: none"> Descriptive statistics Qualitative investigation 	<ul style="list-style-type: none"> Restaurant density by ZIP code Restaurant ownership turnover Cumulative turnover percentage Total financial liabilities 	<ul style="list-style-type: none"> Restaurant failures affected more by internal than by external factors Restaurant failure is highest in the ZIP code areas with high restaurant concentration Failure rates are higher for small and independent operation firms
Kim & Gu (2006)	<ul style="list-style-type: none"> 18 bankrupt and 18 non-bankruptcy restaurants 1986-1998 	USA	<ul style="list-style-type: none"> Multivariate discriminant analysis (MDA) Logit regression (LR) 	<ul style="list-style-type: none"> TL/TA EBIT/TL 	<ul style="list-style-type: none"> Prudent debt financing policy is critical to lowering bankruptcy risk Restaurant managers should increase EBIT to raise paying ability by good inventory management and labor cost control to lower operating costs
Kim & Gu (2010)	<ul style="list-style-type: none"> 16 bankrupt and 16 non-bankrupt hospitality firms 1999-2004 	USA	<ul style="list-style-type: none"> Logit regression (LR) 	<ul style="list-style-type: none"> Operating cash flow/TL 	<ul style="list-style-type: none"> Hospitality firms that heavily rely on debt financing with inability to generate sufficient operating cash flow exhibit higher vulnerability to bankruptcy A conservative financing policy with light reliance on debt and tight labor cost control are recommendable
Youn & Gu (2010)	<ul style="list-style-type: none"> 31 bankrupt and 31 non-bankrupt restaurants 1996-2008 	USA	<ul style="list-style-type: none"> Logit regression (LR) Artificial neural network (ANN) 	<ul style="list-style-type: none"> NI/TA EBITDA/TL 	<ul style="list-style-type: none"> LR is not inferior to ANN in terms of bankruptcy prediction For restaurants heavily in debt, maintaining high EBITDA is critical for survival Restaurants with high cash flow generation can improve EBITDA and ROA

Author	Sample / time period	Country	Methodology	Variables	Main results
Kim (2011)	<ul style="list-style-type: none"> • 33 bankrupt and 33 non-bankrupt hotels • 1995-2002 	Korea	<ul style="list-style-type: none"> • Multivariate discriminant analysis (MDA) • Logit regression (LR) • Artificial neural network (ANN) • Support vector machine (SVM) 	<ul style="list-style-type: none"> • Current ratio • Account receivable turnover • Debt-equity-ratio • Profit margin ratio • S/FA • ROE • Quick ratio • Growth in assets 	<ul style="list-style-type: none"> • ANN and SVM are very applicable models in bankruptcy prediction with data from Korean hotels • As only financial ratio variables were included, it is proposed to integrate other important key quantitative variables (e.g., age, market value etc.)
Parsa et al. (2011)	<ul style="list-style-type: none"> • 3,128 restaurants • 1982-2007 	USA	<ul style="list-style-type: none"> • Survival analysis (SA) 	<ul style="list-style-type: none"> • Location • Affiliation • Size 	<ul style="list-style-type: none"> • Firm longevity increases with company size (increased resources) • Restaurants with group affiliation exhibit lower closing rates • Location of a restaurant influences failure rates
Diakomihalis (2012)	<ul style="list-style-type: none"> • 146 privately owned hotels (30 five-star, 29 four-star, 51 three-star and 36 two-star hotels) • 2007 	Greece	<ul style="list-style-type: none"> • Multivariate discriminant analysis (MDA) • Application of Altman models (1968, 1983) 	<ul style="list-style-type: none"> • WC/TA • RE/TA • EBIT/TA • Market value of equity/Book value of total liabilities • S/TA 	<ul style="list-style-type: none"> • Altman models can be applied with a high degree of reliability and accuracy to forecast bankruptcies of hotels • Bankruptcy risk is the smallest for two-star hotels, whereas the risk for five- and three-star hotels is higher compared to four-star hotels
Park & Hancer (2012)	<ul style="list-style-type: none"> • 48 hospitality firms filed bankruptcy under Chapter 11 matched with 48 non-bankrupt hospitality firms • 1990-2009 	USA	<ul style="list-style-type: none"> • Logit regression (LR) • Artificial neural network (ANN) 	<ul style="list-style-type: none"> • WC/TA • TL/TA • Liabilities/net worth • EBIT/CL • (FCF + interest expense)/debt • (FCF + dividend)/debt 	<ul style="list-style-type: none"> • Neural network provides outstanding work in classification compared to logit regression • Bankrupt firms have less liquidity and solvency to meet short-term and long-term debt obligations • Extensive debt financing of hospitality firms forces them to file for bankruptcy
Parsa et al. (2015)	<ul style="list-style-type: none"> • 124 failed and 372 non-failed restaurants • 2000-2010 	USA	<ul style="list-style-type: none"> • Descriptive statistics 	<ul style="list-style-type: none"> • ZIP code • Size • Restaurant type • Homeowners and renters 	<ul style="list-style-type: none"> • Restaurant size and location influence restaurant failure rates • Full-service restaurants have lower failure rate compared to full-service restaurants • Apartment dwellers and transient population contribute to success of restaurants
Zhai et al. (2015)	<ul style="list-style-type: none"> • 43 failed and non-failed hotels • 1999-2008 	Korea	<ul style="list-style-type: none"> • Multivariate discriminant analysis (MDA) 	<ul style="list-style-type: none"> • CA/CL • QA/CL • TL/TA • NI/S • NI/Shareholder equity • S/FA • Total ordinary profit rate 	<ul style="list-style-type: none"> • Hotels with high debt burden and low fixed asset turnover are more likely to fail • Increase in debt (especially in short-term debt) is a major reason for hotel firm failure • Prediction models are valuable for managers, stockholders, investors etc. in order to determine the financial health of hotels

Author	Sample / time period	Country	Methodology	Variables	Main results
				<ul style="list-style-type: none"> • Normal profit/NW • Growth rate of TA 	
Fernández-Gómez et al. (2016)	<ul style="list-style-type: none"> • 316 hotels (158 bankrupt/158 non-bankrupt) over the observation period • Pooled data for 2005 - 2012 	Spain	<ul style="list-style-type: none"> • Multi-layer perceptrons (MLP) neural network • Probabilistic neural network (PNN) 	<ul style="list-style-type: none"> • EBITDA/CL • ROA • Net Profit Margin 	<ul style="list-style-type: none"> • Probability of failure increases with lack of profitability and insufficient funds to cover debt • PNN shows higher accuracy in predicting bankrupt/non-bankrupt firms compared to MLP • Managers could optimize their hotels by increase in efficiency, whereas in this context the hotel size, quality, investment in intangible assets and the affiliation in a hotel group must be considered
Barreda et al. (2017)	<ul style="list-style-type: none"> • 15 bankrupt and 15 financially sound restaurant and hotel firms • 1992-2010 	USA	<ul style="list-style-type: none"> • Multivariate discriminant analysis (MDA) • Logit regression (LR) 	<ul style="list-style-type: none"> • WC/TA • S/TA • TD/TE • NI/TA 	<ul style="list-style-type: none"> • MDA outperformed LR in overall prediction accuracy • Seasonality of operation and external factors are affecting financial failures of the hospitality industry • Profitability (proxied by NI/TA) showed the highest impact on the probability of bankruptcy • Negative correlation between WC/TA and the probability of bankruptcy
Li et al. (2017)	<ul style="list-style-type: none"> • 11 failed and 24 non-failed hospitality firms • 1998-2013 	China	<ul style="list-style-type: none"> • Application of several statistical, intelligence and ensemble models (e.g., MDA, LR, PR, SVM etc.) 	<ul style="list-style-type: none"> • Net assets/TL • Net assets/TA • S/TA • Net assets per share • Surplus per share • Provident fund per share 	<ul style="list-style-type: none"> • Application of intelligence models improves the reliability of early warning signals of firm failure • A hospitality firms is more likely to fail, when there is a decrease in asset turnover and in fund per share in the two years prior to failure • Non-failure hospitality firms in general display a healthier financial situation compared to failed ones
Kim (2018)	<ul style="list-style-type: none"> • 89 financially distressed and 1,048 non-financially distressed hospitality firms • 1988-2010 	USA	<ul style="list-style-type: none"> • Neural network (NN) • Support vector machine (SVM) • Decision tree (DT) 	<ul style="list-style-type: none"> • Debt-to-equity • Growth in owners' equity • Net profit margin • Stock price trends • Account receivable turnover • Management practice 	<ul style="list-style-type: none"> • Economic variables other than traditional financial ratios provide more information for theory building on the causes of hospitality financial distress • Stock-price-information can be added to accounting information to predict financial distress • Profitability, growth and solvency ratios are good predictors of financial distress
Gemar et al. (2019)	<ul style="list-style-type: none"> • 41 closed and 313 non-closed resort hotels • Only hotels with annual operative revenue 	Spain	<ul style="list-style-type: none"> • Cox's semi-parametric proportional hazards regression 	<ul style="list-style-type: none"> • WC • Legal form • Tourism location • Employee cost/operating revenue 	<ul style="list-style-type: none"> • Size, location, good management practices and business cycle influence hotel's life span • Professional management team in hotel companies as key variable for success • Survival is closely linked to business cycles due to capital intensity of hotel business

Author	Sample / time period	Country	Methodology	Variables	Main results
	<ul style="list-style-type: none"> above 500,000 EUR • 1997 - 2009 				
Becerra-Vicario et al. (2020)	<ul style="list-style-type: none"> • 230 insolvent and 230 solvent restaurants • 2008-2017 	Spain	<ul style="list-style-type: none"> • Deep recurrent convolutional neural network (DRCNN) • Logit regression (LR) 	<ul style="list-style-type: none"> • S/TA • NI/S • NI/TA • EBIT/TA • TL/TA • Quality certificate 	<ul style="list-style-type: none"> • Variables related to liquidity, profitability and solvency are best predictors of bankruptcy • Quality of services is a relevant prediction variable • DRCNN is a suitable computational technique in predicting bankruptcy results
Abidin et al. (2021)	<ul style="list-style-type: none"> • 634 bankrupt and 634 non-bankrupt hospitality firms • 2000-2016 	Malaysia	<ul style="list-style-type: none"> • Logit regression (LR) 	<ul style="list-style-type: none"> • Age • Gender diversity • Board size • Subsidiary • NI/TA 	<ul style="list-style-type: none"> • Importance of ROA and firm age to predict bankruptcy risk of SMEs in the hospitality industry • Classification accuracy of models increases the closer an SME moves toward bankruptcy with a less number but significant variables
Belda & Cabrer-Borrás (2021)	<ul style="list-style-type: none"> • 6,809 Active and 1,179 non-active hospitality enterprises • 2009-2015 	Spain	<ul style="list-style-type: none"> • Logit regression (LR) • Cox proportional hazard model 	<ul style="list-style-type: none"> • Size • Age • S/workers • Financial leverage • Positive profitability • Positive cash flow 	<ul style="list-style-type: none"> • Size, age, productivity, financial leverage, positive productivity and liquidity positively affect the survival of hospitality enterprises • Good management ensures good performance and supports survival of hospitality enterprises
Vivel-Búa & Lado-Sestayo (2021)	<ul style="list-style-type: none"> • 505 failed and 3,443 non-failed hotels • 2012-2015 	Spain	<ul style="list-style-type: none"> • Probit regression (PR) 	<ul style="list-style-type: none"> • Income/TA • Asset efficiency • Distance in kilometers to nearest airport / nearest train station • Concentration • Seasonality • Hotel rooms;/number of hotels; • Occupancy rate 	<ul style="list-style-type: none"> • Besides variables related to characteristics of the hotel and the tourist destination contagion effect should be considered to explain hotel failure • Hotel managers should improve asset efficiency to overcome hotel failure • Size, distance to transport nodes, efficiency and market share in the Spanish hotel sector show a negative relation to hotel failure

Note: The order of inclusion was according to the year of publication (from oldest to youngest). In the column "Variables", only those variables were included that were significant in the respective studies or were included in the final screening models. The following abbreviations were used: CA = current assets; CL = current liabilities; FA = fixed assets; FCF = free cash flow; GP = gross profit; NA = net assets; NI = net income; QA = quick assets; RE = retained earnings; ROA = return on assets; SE = shareholder equity; TA = total assets; S = sales; TL = total liabilities; WC = working capital

Table A2. Correlation and factor analysis of financial statement ratios for all firms

Variable	Rotated component matrix			Correlation matrix								
	Factor 1	Factor 2	Factor 3	SIZE	AGE	CA_TA	WC_TA	EBIT_TA	EBT_TA	NI_TA	TE_TA	TD_TA
SIZE		0.684		--								
AGE				-.072*	--							
CA_TA			0.841	-.309**	0.028	--						
WC_TA			0.690	.136**	-0.039	.244**	--					
EBIT_TA	0.873			.265**	-0.046	0.014	.081*	--				
EBT_TA	0.940			.325**	-0.068	.110**	.165**	.749**	--			
NI_TA	0.912			.388**	-.086*	0.056	.191**	.743**	.971**	--		
TE_TA		0.896		.468**	-.074*	-0.004	.115**	.406**	.448**	.525**	--	
TD_TA		-0.896		-.468**	.074*	0.004	-.115**	-.406**	-.448**	-.525**	-1.000**	--

Notes: The table shows the results of factor analysis and bivariate correlation analysis all firms. In the factor analysis, three factors could be extracted using Varimax rotation, as this method allows the clearest separation of factors. Absolute values smaller than 0.33 were suppressed following Ho (2014, 249), so that their values do not appear in the rotated component matrix. The three factors can explain 70.455 % of the total variance (Burns & Burns, 2008, 449-459; Foster *et al.*, 2006, 75; Ho, 2014, 255). Significances: *) 5 percent level; **) 1 percent. n= 776 observations

Table A3. Correlation and factor analysis of financial statement ratios for hotel firms

Variable	Rotated component matrix				Correlation matrix								
	Factor 1	Factor 2	Factor 3	Factor 4	SIZE	AGE	CA_TA	WC_TA	EBIT_TA	EBT_TA	NI_TA	TE_TA	TD_TA
SIZE		0.425	-0.334	0.366	--								
AGE				0.924	.149**	--							
CA_TA			0.839		-.215**	-0.039	--						
WC_TA			0.792		0.008	0.065	.416**	--					
EBIT_TA	0.653				.094*	0.065	0.014	0.033	--				
EBT_TA	0.937				.162**	.099*	.149**	.123**	.417**	--			
NI_TA	0.933				.169**	.118*	.103*	.107*	.396**	.942**	--		
TE_TA		0.979			.256**	-0.015	0.085	.107*	0.027	.143**	.119*	--	
TD_TA		-0.979			-.256**	0.015	-0.085	-.107*	-0.027	-.143**	-.119*	-1.000**	--

Notes: The table shows the results of factor analysis and bivariate correlation analysis for hotels. In the factor analysis, four factors could be extracted using Varimax rotation, as this method allows the clearest separation of factors. Absolute values smaller than 0.33 were suppressed following Ho (2014, 249), so that their values do not appear in the rotated component matrix. The three factors can explain 76.789 % of the total variance (Burns & Burns, 2008, 449-459; Foster *et al.*, 2006, 75; Ho, 2014, 255). Significances: *) 5 percent level; **) 1 percent. n= 466 observation

Table A4. Correlation and factor analysis of financial statement analysis ratios for restaurant firms

Variable	Rotated component matrix				Correlation matrix								
	Factor 1	Factor 2	Factor 3	Factor 4	SIZE	AGE	CA_TA	WC_TA	EBIT_TA	EBT_TA	NI_TA	TE_TA	TD_TA
SIZE		0.573	-0.596		--								
AGE			0.752		-.272**	--							
CA_TA			0.552	0.665	-.232**	.148**	--						
WC_TA				0.838	.193**	-0.104	.189**	--					
EBIT_TA	0.934				.381**	-.162**	0.046	0.110	--				
EBT_TA	0.951				.417**	-.165**	.112*	.177**	.955**	--			
NI_TA	0.916				.476**	-.199**	0.070	.212**	.950**	.980**	--		
TE_TA		0.926			.503**	-.122*	0.067	.122*	.561**	.505**	.576**	--	
TD_TA		-0.926			-.503**	.122*	-0.067	-.122*	-.561**	-.505**	-.576**	-1.000**	--

Notes: The table shows the results of factor analysis and bivariate correlation analysis for restaurants. In the factor analysis, four factors could be extracted using Varimax rotation, as this method allows the clearest separation of factors. Absolute values smaller than 0.33 were suppressed following Ho (2014, 249), so that their values do not appear in the rotated component matrix. The

three factors can explain 86.388 % of the total variance (Burns & Burns, 2008, 449-459; Foster *et al.*, 2006, 75; Ho, 2014, 255).
Significances: *) 5 percent level; **) 1 percent. n= 310 observations

Table A5. Marginal effects analyses on logistic regressions: All firms

Variable	Model I		Model II		Model III		Model IV	
	dy/dx	S.E.	dy/dx	S.E.	dy/dx	S.E.	dy/dx	S.E.
<i>Firm-specific level:</i>								
SIZE	-0,814***	0,248	-0,812***	0,249	-0,816***	0,249	-0,813***	0,249
SIZE ²	0,059***	0,019	0,058***	0,020	0,059***	0,019	0,058***	0,020
AGE	0,011	0,123	-0,015	0,123	0,011	0,123	-0,015	0,123
AGE ²	-0,029	0,049	-0,020	0,049	-0,030	0,049	-0,020	0,049
CA_TA	0,023	0,048	0,046	0,049	0,022	0,048	0,046	0,049
WC_TA	-0,344***	0,124	-0,339***	0,126	-0,344***	0,124	-0,339***	0,126
EBIT_TA	-0,914***	0,111	-0,859***	0,111	-0,915***	0,111	-0,859***	0,112
TE_TA	-0,342***	0,057	-0,375***	0,058	-0,342***	0,057	-0,375***	0,058
ONEG	0,294***	0,059	0,291***	0,060	0,294***	0,059	0,291***	0,060
REL_DIV	-0,131**	0,057	-0,083	0,060	-0,130**	0,057	-0,082	0,061
UNREL_DIV1	0,007	0,033	-0,004	0,034	0,007	0,033	-0,004	0,034
UNREL_DIV2	-0,090**	0,039	-0,074*	0,039	-0,090**	0,039	-0,074*	0,039
AFFIL	-0,030	0,036	-0,044	0,035	-0,030	0,036	-0,044	0,035
LEG_FORM	0,273***	0,053	0,284***	0,053	0,273***	0,053	0,284***	0,053
<i>Destination level:</i>								
URBAN1	-0,045	0,046	-0,049	0,056	-0,045	0,046	-0,049	0,057
URBAN2	-0,206***	0,053	-0,180***	0,053	-0,206***	0,053	-0,180***	0,053
TOURISM	-0,058	0,049	-0,077	0,052	-0,057	0,049	-0,077	0,052
PERM_SETT	0,055	0,055	0,054	0,086	0,055	0,055	0,054	0,087
<i>Industry forces:</i>								
IND_HOSP			0,092***	0,031			0,092***	0,031
ALS			-0,006	0,033			-0,006	0,033
CHG_TOURINT			0,017	0,153			0,014	0,156
<i>National economy level:</i>								
FIXED_INV_LAG1					-0,011	0,067	-0,005	0,068

Notes: Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 776 observations (group 0: 496; group 1: 280)

Table A6. Marginal effects analyses on logistic regressions: Hotel firms

Variable	Model I		Model II		Model III		Model IV	
	dy/dx	S.E.	dy/dx	S.E.	dy/dx	S.E.	dy/dx	S.E.
<i>Firm-specific level:</i>								
SIZE	-0.063*	0.032	-0.070**	0.033	-0.062*	0.032	-0.069**	0.033
SIZE ²								
AGE	-0.088**	0.041	-0.086**	0.041	-0.090**	0.041	-0.087**	0.041
AGE ²								
CA_TA	0.020	0.068	-0.013	0.070	0.021	0.068	-0.010	0.070
WC_TA	-0.362	0.247	-0.340	0.254	-0.344	0.247	-0.328	0.253
EBIT_TA	-1.221***	0.169	-1.209***	0.169	-1.214***	0.169	-1.206***	0.170
TE_TA	-0.457***	0.076	-0.428***	0.078	-0.459***	0.076	-0.432***	0.078
ONEG	0.170**	0.080	0.173**	0.079	0.168**	0.080	0.171**	0.079
REL_DIV	-0.187	0.220	-0.155	0.246	-0.204	0.226	-0.171	0.252
UNREL_DIV ₁	-0.050	0.041	-0.036	0.041	-0.050	0.041	-0.038	0.042
UNREL_DIV ₂	-0.080	0.053	-0.076	0.052	-0.080	0.053	-0.076	0.053
AFFIL	-0.050	0.044	-0.051	0.044	-0.053	0.045	-0.054	0.044
LEG_FORM	0.300***	0.063	0.300***	0.062	0.303***	0.063	0.303***	0.062
<i>Destination level:</i>								
URBAN ₁	0.070	0.062	-0.025	0.085	0.073	0.062	-0.018	0.086
URBAN ₂	-0.150**	0.074	-0.137*	0.074	-0.150**	0.074	-0.137*	0.075
TOURISM	-0.003	0.064	0.022	0.065	-0.002	0.064	0.022	0.065
PERM_SETT	0.071	0.068	-0.090	0.121	0.072	0.068	-0.079	0.122
<i>Industry forces:</i>								
ALS			-0.075	0.048			-0.070	0.048
CHG_TOURINT			0.095	0.207			0.084	0.211
<i>National economy level:</i>								
FIXED_INV_LAG ₁					-0.019	0.094	-0.008	0.095
SIZExCHG_GDP_LAG ₁					-0.099	0.103	-0.077	0.105

Notes: Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 466 observations (group 0: 304; group 1: 162)

Table A7. Marginal effects analyses on logistic regressions: Restaurant firms

Variable	Model I		Model II		Model III	
	dy/dx	S.E.	dy/dx	S.E.	dy/dx	S.E.
<i>Firm-specific level:</i>						
SIZE	-1,393***	0,323	-1,389***	0,320	-1,395***	0,334
SIZE ²	0,102***	0,025	0,102***	0,025	0,102***	0,026
AGE	0,070	0,043	0,071	0,043	0,070	0,043
AGE ²						
CA_TA	0,136**	0,063	0,140**	0,064	0,135**	0,064
WC_TA	-0,183	0,124	-0,190	0,124	-0,183	0,124
EBIT_TA	-0,522***	0,147	-0,527***	0,148	-0,522***	0,148
TE_TA	-0,646***	0,140	-0,641***	0,138	-0,647***	0,147
ONEG	0,286***	0,100	0,298***	0,105	0,286***	0,100
REL_DIV	0,026	0,061	0,024	0,061	0,026	0,061
UNREL_DIV ₁	0,235***	0,069	0,233***	0,068	0,235***	0,069
UNREL_DIV ₂	-0,004	0,074	-0,006	0,075	-0,004	0,074
AFFIL	-0,086*	0,052	-0,087*	0,052	-0,086	0,052
LEG_FORM	0,404***	0,112	0,408***	0,114	0,404***	0,114
<i>Destination level:</i>						
URBAN ₁	-0,416***	0,089	-0,411***	0,090	-0,416***	0,096
URBAN ₂	-0,475***	0,092	-0,477***	0,092	-0,476***	0,098
TOURISM	-0,176	0,132	-0,174	0,133	-0,177	0,134
PERM_SETT	-0,207**	0,103	-0,201*	0,103	-0,207**	0,105
<i>Industry forces:</i>						
ALS						
CHG_TOURINT			-0,122	0,189		
<i>National economy level:</i>						
SIZExCHG_GRP_LAG ₀					-0,002	0,118

Notes: Significances: *) 10 percent level; **) 5 percent level; ***) 1 percent. n= 310 observations (group 0: 192; group 1: 118)

References

- Aaker, D. A., & Jacobson, R. (1987). The role of risk in explaining differences in profitability. *The Academy of Management Journal*, 30(2), 277-296.
- Aalbers, H., Adriaanse, J., Boon, G.-J., van der Rest, J.-P., Vriesendorp, R., & Van Wersch, F. (2019). Does pre-packed bankruptcy create value? An empirical study of post-bankruptcy employment retention in The Netherlands. *International Insolvency Review*, 28(3), 320-339.
- Abdou, H. A., & Pointon, J. (2011). Credit scoring, statistical techniques and evaluation criteria: A review of the literature. *Intelligent Systems in Accounting, Finance and Management*, 18(2/3), 59-88.
- Abidin, J. Z., Abdullah, N. A. H., & Khaw, K. L.-H. (2021). Bankruptcy prediction: SMEs in the hospitality industry. *The International Journal of Banking and Finance*, 16(2), 51-80.
- Acosta-González, E., Fernández-Rodríguez, F., & Ganga, H. (2019). Predicting corporate financial failure using macroeconomic variables and accounting data. *Computational Economics*, 53(1), 227-257.
- Agnihotri, A. (2014). Impact of strategy-capital structure on firms' overall financial performance. *Strategic Change*, 23(1/2), 15-20.
- Aldrich, H. E., & Auster, E. (1986). Even dwarfs started small: Liability of age and size and their strategic implications. *Research in Organizational Behavior*, 8, 165-198.
- Alberca, P., & Parte, L. (2018). Operational efficiency evaluation of restaurant firms. *International Journal of Contemporary Hospitality Management*, 30(3), 1959-1977.
- Almeida, H. & Philippon, T. (2007). The risk-adjusted cost of financial distress. *The Journal of Finance*, 62(6), 2557-2586.
- Altman, E. I., Sabato, G., & Wilson, N. (2010). The value of non-financial information in small and medium-sized enterprise risk management. *The Journal of Credit Risk*, 6(2), 1-33.
- Altman, E. I. (1983). *Corporate financial distress: A complete guide to predicting, avoiding, and dealing with bankruptcy*. New York, NY: John Wiley & Sons.
- Altman, E. I. (1969). Corporate bankruptcy potential, stockholder returns and share valuation. *The Journal of Finance*, 24(5), 887-900.
- Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23(4), 589-609.
- Amoa-Gyarteng, K. (2021). Corporate financial distress: The impact of profitability, liquidity, assets productivity, activity and solvency. *Journal of Accounting, Business and Management*, 28(2), 104-115.
- Anandarajan, M., Lee, P., & Anandarajan, A. (2001). Bankruptcy prediction of financially stressed firms: An examination of the predictive accuracy of artificial neural networks. *International Journal of Intelligent Systems in Accounting, Finance & Management*, 10(2), 69-81.
- Anders, U., & Szczeny, A. (1998). Prognose von Insolvenzen mit Hilfe logistischer neuronaler Netze. *Zeitschrift für betriebswirtschaftliche Forschung*, 50(10), 892-915.
- Anderson, R. (2007). *The credit scoring toolkit: Theory and practice for retail credit risk management and decision automation*. New York, NY: Oxford University Press.
- Andersson, U., Forsgren, M., & Holm, U. (2002). The strategic impact of external networks: Subsidiary performance and competence development in the multinational corporation. *Strategic Management Journal*, 23(11), 979-996.
- Andreano, S. M., Benedetti, R., Mazzitalli, A., & Piersimoni, F. (2018). Spatial autocorrelation and clusters in modelling corporate bankruptcy of manufacturing firms. *Economia e Politica Industriale*, 45(2), 475-491.
- Arend, R. J., & Lévesque, M. (2010). Is the resource-based view a practical organizational theory? *Organization Science*, 21(4), 913-930.
- Armstrong, C. E., & Shimizu, K. A. (2007). A review of approaches to empirical research on the resource-based view of the firm. *Journal of Management*, 33(6), 959- 986.

- Assaf, G. A., & Josiassen, A. (2012). Identifying and ranking the determinants of tourism performance: A global investigation. *Journal of Travel Research*, 51(4), 388-399.
- Audretsch, D. B., & Dohse, D. (2007). Location: A neglected determinant of firm growth. *Review of World Economics*, 143(1), 79-107.
- Axioglou, C., & Christodoulakis, N. (2021). Which firms survive in a crisis? Investigating Gibrat's law in Greece 2001-2014. *Journal of Industrial and Business Economics*, 48(4), 159-217.
- Balasubramanian, S.A., Radhakrishna, G.S., Sridevi, P., & Natarjan, T. (2019). Modeling corporate financial distress using financial and non-financial variables: The case of Indian listed companies. *International Journal of Law and Management*, 61(3/4), 457-484.
- Balcaen, S., Manigart, S., & Ooghe, H. (2011). From distress to exit: Determinants of the time to exit. *Journal of Evolutionary Economics*, 21(3), 407-446.
- Barney, J. B. (2001). Resourced-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, 27(6), 643-650.
- Barniv, R., & Raveh, A. (1989). Identifying financial distress: A new nonparametric approach. *Journal of Business Finance & Accounting*, 16(3), 361-383.
- Barreda, A. A., Kageyama, Y., Singh, D., & Zubieta, S. (2017). Hospitality bankruptcy in United States of America: A multiple discriminant analysis-logit model comparison. *Journal of Quality Assurance in Hospitality & Tourism*, 18(1), 86-106.
- Beaver, W. H., McNichols, M. F., & Rhie, J.-W. (2005). Have financial statements become less informative? Evidence from the ability of financial ratios to predict bankruptcy. *Review of Accounting Studies*, 10(1), 93-122.
- Beaver, W., Kettler, P., & Scholes, M. (1970). The association between market determined and accounting determined risk measures. *The Accounting Review*, 45(4), 654-682.
- Beaver, W. H. (1968). Alternative accounting measures as predictors of failure. *The Accounting Review*, 43(1), 113-122.
- Becerra-Vicario, R., Alaminos, D., Aranda, E., & Fernández-Gámez, M. A. (2020). Deep recurrent convolutional neural network for bankruptcy prediction: A case of the restaurant industry. *Sustainability*, 12(12), 1-15.
- Bee, M., Espa, G., & Tamborini, R. (2004). Firms' bankruptcy and turnover in a macroeconomy. In: M. Gallegati, A. P. Kirman & M. Marsili (Eds.), *The complex dynamics of economic interaction: Essays in economics and econophysics* (pp. 79-106). Berlin-Heidelberg: Springer.
- Belda, P. R., & Cabrer-Borrás, B. (2021). Size and survival of the hospitality industry: The case of Spain. *Tourism Economics*, 27(5), 933-951.
- Ben-Zion, U., & Shalit, S. S. (1975). Size, leverage, and dividend record as determinants of equity risk. *The Journal of Finance*, 30(4), 1015-1026.
- Bernanke, B. (1981). Bankruptcy, liquidity, and recession. *The American Economic Review*, 71(2), 155-159.
- Bhattacharjee, A., Higson, C., Holly, S., & Kattuman, P. (2009). Macroeconomic instability and business exit: Determinants of failures and acquisitions of UK firms. *Economica*, 76(301), 108-131.
- Bleile, G. (1983). Business cycle and tourism demand in Germany (FRG). *The Tourist Review*, 38(4), 23-24.
- Botazzi, G., Grazi, M., Secchi, A., & Tamagni, F. (2011). Financial and economic determinants of firm default. *Journal of Evolutionary Economics*, 21(3), 373-406.
- Burns, R. B., & Burns, R. A. (2008). *Business research methods and statistics using SPSS*. London, UK: Sage Publications.
- Butera, G., & Faff, R. (2006). An integrated multi-model credit rating system for private firms. *Review of Quantitative Finance & Accounting*, 27(3), 311 - 340.
- Candela, G., & Figini, P. (2012). *The economics of tourism destinations*. Berlin-Heidelberg: Springer.

- Carter, R., & Van Auken, H. (2006). Small firm bankruptcy. *Journal of Small Business Management*, 44(4), 493-512.
- Castanias, R. (1983). Bankruptcy risk and optimal capital structure. *The Journal of Finance*, 38(5), 1617-1635.
- Cerrato, D., & Piva, M. (2012). The internationalization of small and medium-sized enterprises: The effect of family management, human capital and foreign ownership. *Journal of Management & Governance*, 16(4), 617-644.
- Cestari, G., Risaliti, G., & Pierotti, M. (2013). Bankruptcy prediction models: Preliminary thoughts on the determination of parameters for the evaluation of effectiveness and efficiency. *European Scientific Journal*, 9(16), 265-290.
- Chalupka, R. & Kopeckni, J. (2009). Modeling Bank Loan LGD of Corporate and SME Segments: A Case Study. *Czech Journal of Economics and Finance*, 59(4), 360-382.
- Chatterjee, S., & Wernerfelt, B. (1991). The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal*, 12(1), 33-48.
- Chava, S. and Jarrow, R. A. (2004). Bankruptcy prediction with industry effects. *Review of Finance*, 8(4), 537-569.
- Chatterjee, S., Dhillon, U. S., & Ramirez, G. G. (1996). Resolution of financial distress: Debt restructurings via chapter 11, prepackaged bankruptcies, and workouts. *Financial Management*, 25(1), 5-18.
- Chen, M.-H. (2013). Risk determinants of China's hotel industry. *Tourism Economics*, 19(1), 77-99.
- Chen, K. H., & Shimerda, T.A. (1981). An empirical analysis of useful financial ratios. *Financial Management*, 10(1), 51-60.
- Chen, Y., Jiang, Y., Wang, C., & Hsu, W. C. (2014). How do resources and diversification strategy explain the performance consequences of internationalization? *Management Decision*, 52(5), 897-915.
- Claessens, S., Djankov, S., & Klapper, L. (2003). Resolution of corporate distress in East Asia. *Journal of Empirical Finance*, 10(1/2), 199-216.
- Clegg, S. R., Schweitzer, J., Whittle, A., & Pitelis, C. (2017). *Strategy: Theory and practice*. London, UK: Sage Publications.
- Cook, G. A. S., Pandit, N. R., & Milman, D. (2011). A resource-based analysis of bankruptcy law, SMEs and corporate recovery. *International Small Business Journal*, 30(3), 275-293.
- Dambolena, I. G., & Khoury, S. J. (1980). Ratio stability and corporate failure. *The Journal of Finance*, 35(4), 1017-1026.
- Dawley, D. D., Hoffman, J. J., & Brockman, E. N. (2003). Do size and diversification type matter? An examination of post-bankruptcy outcomes. *Journal of Managerial Issues*, 15(4), 413-429.
- Deeg, J. (2009). Organizational discontinuity: Integrating evolutionary and revolutionary change theories. *Management Revue*, 20(2), 190-208.
- Dewaelheyns, N., & van Hulle, C. (2006). Corporate failure prediction modelling: Distorted by business group' internal capital markets? *Journal of Business Finance & Accounting*, 33(5/6), 909-931.
- Diakomihalis, M. (2012). The accuracy of Altman's models in predicting hotel bankruptcy. *International Journal of Accounting and Financial Reporting*, 2(2), 1-18.
- Dickinson, V. (2011). Cash flow patterns as a proxy for firm life cycle. *The Accounting Review*, 86(6), 1969-1994.
- Doubek, C., Exler, M. W., & Situm, M. (2016). Aktueller Stand von Früherkennungssystemen: Eine systematische Übersicht zu Ansätzen zwecks Früherkennung von strategischen Unternehmenskrisen. *Krisen-, Sanierungs- und Insolvenzberatung*, 12(5), 204-210.
- Dritsakis, N., & Athanasiadis, S. (2000). An econometric model of tourist demand: The case of Greece. *Journal of Hospitality & Leisure Marketing*, 7(2), 39-49.

- Drobetz, W., & Wanzenried, G. (2006). What determines the speed of adjustment to the target capital structure? *Applied Financial Economics*, 16(13), 941-958.
- Duncan, J. W., Ginter, P. M., & Swayne, L. E. (1998). Competitive advantage and internal organizational assessment. *The Academy of Management Executive*, 12(3), 6-16.
- El Hennawy, R. H. A., & Morris, R. C. (1983). Market anticipation of corporate failure in the UK. *Journal of Business Finance & Accounting*, 10(3), 359-372.
- Enright, M. J., & Newton, J. (2004). Tourism destination competitiveness: A quantitative approach. *Tourism Management*, 25(6), 777-788.
- English, W. (1996). Restaurant attrition: A longitudinal analysis of restaurant failures. *International Journal of Contemporary Hospitality Management*, 8(2), 17-20.
- Esteve-Pérez, S., & Mañez-Castillejo, J. A. (2008). The resource-based theory of the firm and firm survival. *Small Business Economics*, 30(3), 231-249.
- Everett, J., & Watson, J. (1998). Small business failure and external risk factors. *Small Business Economics*, 11(4), 371-390.
- Exler, M. W., & Situm, M. (2019). Aktueller Forschungsstand zur Krisen- und Insolvenzfrüherkennung. In M. W. Exler & M. Situm (Eds.), *Restrukturierungs- und Turnaround-Management: Strategie, Erfolgsfaktoren und Best Practice für die Transformation* (pp. 19-53). Berlin: Erich Schmidt Verlag.
- Farooq, U., Quamar, M.A.J., & Reddy, K. (2020). Impact size and determinants of indirect cost of financial distress: Role of receivable and inventory management. *Asian Academy of Management Journal of Accounting and Finance*, 16(2), 179-207.
- Fawcett, T. (2006). An introduction into ROC analysis. *Pattern Recognition Letters*, 27(8), 861-874.
- Fernández-Gámez, M. Á., Cisneros-Ruiz, A. J., & Callejón-Gil, Á. (2016). Applying a probabilistic neural network to hotel bankruptcy prediction. *Tourism & Management Studies*, 12(1), 40-52.
- Fernández-Gámez, M. Á., & Becerra, R. (2015). An analysis of Spanish hotel efficiency. *Cornell Hospitality Quarterly*, 56(3), 248-257.
- Forgione, A. F., & Migliardo, C. (2019). An empirical analysis of the impact of trade credit on bank debt restructuring. *Economia Politica*, 36(2), 415-438.
- Foster, J., Barkus, E., & Yavorsky, C. (2006). *Understanding and using advanced statistics: A practical guide for students*. London, UK: Sage Publications.
- Frank, M. Z. and Goyal, V. K. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, 38(1), 1-37.
- Fredland, E. C., & Morris, C. E. (1976). A cross section analysis of small business failure. *American Journal of Small Business*, 1(1), 7-18.
- Freeman, J., Carroll, G. R., & Hannan, M. T. (1983). The liability of newness: Age dependence in organizational death rates. *American Sociological Review*, 48(5), 692-710.
- Gemar, G., Soler, I. P., & Guzman-Parra, V. F. (2019). Predicting bankruptcy in resort hotels: A survival analysis. *International Journal of Contemporary Hospitality Management*, 31(4), 1546-1566.
- Gilbert, L. R., Menon, K., & Schwartz, K. B. (1990). Predicting bankruptcy for firms in financial distress. *Journal of Business Finance & Accounting*, 17(1), 161-171.
- Glancey, K. (1998). Determinants of growth and profitability in small entrepreneurial firms. *International Journal of Entrepreneurial Behavior & Research*, 4(1), 18-27.
- Gomes de Menezes, A., Vieira, J. C., & Moniz, A. I. (2009). Determinants of length of stay - A parametric survival analysis. In Á. Matias, P. Nijkamp & M. Sarmiento (Eds.), *Advances in tourism economics: New developments* (pp. 85-106). Berlin-Heidelberg: Physica-Verlag.
- Grunert, J., Norden, L., & Weber, M. (2005). The role of non-financial factors in internal credit ratings. *Journal of Banking & Finance*, 29(2), 509-531.
- Gruszczynski, M. (2020). *Financial microeconometrics: A research methodology in corporate finance and accounting*. Cham: Springer.

- Gu, Z. (2002). Analyzing bankruptcy in the restaurant industry: A multiple discriminant model. *International Journal of Hospitality Management*, 21(1), 25–42.
- Gu, Z., & Gao, L. (2000). A multivariate model for predicting business failures of hospitality firms. *Tourism and Hospitality Research*, 2(1), 37–49.
- Gulati, R., Nohria, N. & Zaheer, A. (2000) Strategic networks. *Strategic Management Journal*, 21(3), 203–215.
- Gupta, J., Barzotto, M., & Khorasgani, A. (2018). Does size matter in predicting SMEs failure? *International Journal of Finance & Economics*, 23(4), 571–605.
- Haans, R. F. J., Pieters, C., & He, Z.-L. (2016). Thinking about U: Theorizing and testing U-and inverted U-shaped relationships in strategy research. *Strategic Management Journal*, 37(7), 1177–1195.
- Haber, J. R. (2005). Assessing how bankruptcy prediction models are evaluated. *Journal of Business & Economics Research*, 3(1), 87–92.
- Habib, A.M., & Kayani, U.N. (2022). Does the efficiency of working capital management affect a firm's financial distress? Evidence from UAE. *Corporate Governance*, 22(7), 1567–1586.
- Hambrick, D. C., & D'Aveni, R.A. (1988). Large corporate failures as downward spirals. *Administrative Science Quarterly*, 33(1), 1–23.
- Hardy, M. & Reynolds, J. (2009). Incorporating categorial information into regression models: The utility of dummy variables. In: Hardy, M. A., & Bryman, A. (Eds.), *The handbook of data analysis* (pp. 209–236). London, UK: Sage Publications.
- Harhoff, D., Stahl, K., & Woywode, M. (1998). Legal form, growth and exit of West German firms – Empirical results for manufacturing construction, trade and service industries. *Journal of Industrial Economics*, 46(4), 453–488.
- Hayden, E. (2011). Estimation of a rating model for corporate exposure. In: Engelmann, B., & Rauhmeier, R. (Eds.), *The Basel II risk parameters: Estimation, validation, stress testing – with applications to loan risk management* (pp. 13–24). Berlin-Heidelberg: Springer.
- Hauschild, S., & zu Knyphausen-Aufseß, D. (2013). The resource-based view of diversification success: Conceptual issues, methodological flaws, and future directions. *Review of Managerial Science*, 7(3), 327–363.
- Hensher, D. A., Jones, S., & Greene, W. H. (2007). An error component logit analysis of corporate bankruptcy and insolvency risk in Australia. *The Economic Record*, 83(260), 86–103.
- Hong, W.-C. (2008). *Competitiveness in the tourism sector: A comprehensive approach from economic and management points*. Heidelberg; Physica-Verlag.
- Hol, S. (2007). The influence of the business cycle on bankruptcy probability. *International Transactions in Operational Research*, 14(1), 75–90.
- Holder-Webb, L., & Cohen, J. R. (2007). The association between disclosure, distress, and failure. *Journal of Business Ethics*, 75(3), 301–314.
- Hua, N., Xiao, Q., & Yost, E. (2013). An empirical framework of financial characteristics and outperformance in troubled economic times. *International Journal of Contemporary Hospitality Management*, 25(6), 945–964.
- Huggins, R., & Thompson, P. (2015). Entrepreneurship, innovation and regional growth: A network theory. *Small Business Economics*, 45(1), 103–128.
- Huggins, R., & Thompson, P. (2014). A network-based view of regional growth. *Journal of Economic Geography*, 14(3), 511–545.
- Johnson, C. G. (1970). Ratio analysis and the prediction of firm failure. *The Journal of Finance*, 25(5), 1166–1168.
- Jones, S. (2017). Corporate bankruptcy prediction: A high dimensional analysis. *Review of Accounting Studies*, 22(4), 1366–1422.

- Jovanovic, B., & MacDonald, G. M. (1994). The life cycle of a competitive industry. *Journal of Political Economy*, 102(2), 322–347.
- Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*, 50(3), 649–670.
- Kahane, L. (2008). *Regression basics*. Thousand Oaks, CA: Sage Publications.
- Kahl, M. (2002). Economic distress, financial distress, and dynamic liquidation. *The Journal of Finance*, 57(1), 135–168.
- Kahya, E., & Theodossiou, P. (1999). Predicting corporate financial distress: A time-series CUSUM methodology. *Review of Quantitative Finance and Accounting*, 13(3), 323–345.
- Keasey, K., & Watson, R. (1991). Financial distress prediction models: A review of their usefulness. *British Journal of Management*, 2(2), 89–102.
- Kim, H., & Gu, Z. (2010). A logistic regression analysis for predicting bankruptcy in the hospitality industry. *The Journal of Hospitality Financial Management*, 14(1), 17–34.
- Kim, H., & Gu, Z. (2006). Predicting restaurant bankruptcy: A logit model in comparison with a discriminant model. *Journal of Hospitality & Tourism Research*, 30(4), 474 – 493.
- Kim, S. Y. (2018). Predicting hospitality financial distress with ensemble models: the case of US hotels, restaurants, and amusement and recreation. *Services Business*, 12(2), 483–503.
- Kim, S. Y. (2011). Prediction of hotel bankruptcy using support vector machine, artificial neural network, logistic regression, and multivariate discriminant analysis. *The Service Industries Journal*, 31(3), 441–468.
- Klecka (1980). *Discriminant analysis*. Newbury Park, CA: Sage Publications.
- Koller, T., Goedhart, M., & Wessels, D. (2010). *Valuation: Measuring and managing the value of companies*. Hoboken, NJ: Wiley & Sons.
- Kücher, A., Mayr, S., Mitter, C., Duller, C., & Feldbauer-Durstmüller, B. (2020). Firm age dynamics and causes of corporate bankruptcy: Age dependent explanations for business failure. *Review of Managerial Science*, 14(3), 633–661.
- La Rocca, M., La Rocca, T., Gerace, D., & Smark, C. (2009). Effect of diversification on capital structure. *Accounting and Finance*, 49(4), 799–826.
- Laitinen, E. K. (2012). Estimating likelihood of filing a petition for reorganization and bankruptcy: Evidence from Finland. *Finnish Journal of Business Economics*, 16(1), 15–40.
- Lavie, D. (2006). The competitive advantage of interconnected firms: An extension of the resource-based-view. *The Academy of Management Review*, 31(3), 638–658.
- Lev, B. & Ohlson, J. A. (1982). Market-based empirical research in accounting: A review, interpretation, and extension. *Journal of Accounting Research*, 20(Supplement), 249–322.
- Li, H., Xu, Y.-H., & Yu, L. (2017). Predicting hospitality firm failure: Mixed sample modelling. *International Journal of Contemporary Hospitality Management*, 29(7), 1770–1792.
- Liou, D.-K., & Smith, M. (2007). Macroeconomic variables and financial distress. *Journal of Accounting, Business & Management*, 14(1), 17–31.
- Liu, J. (2009). Business failures and macroeconomic factors in the UK. *Bulletin of Economic Research*, 61(1), 47–72.
- Lockett, A., Thompson, S., & Morgenstern, U. (2009). The development of the resource-based view of the firm: A critical appraisal. *International Journal of Management Reviews*, 11(1), 9–28.
- Löffler, G., & Posch, P.N. (2007). *Credit risk modeling using Excel and VBA*. Hoboken, NJ: Wiley & Sons.
- Long, S. J., & Cheng, S. (2009). Regression models for categorical outcomes. In M. Hardy & A. Bryman (Eds.), *The handbook of data analysis* (pp. 259–284). London, UK: Sage Publications.
- Lumpkin, G. T., McKelvie, A., Gras, D. M., & Nason, R. S. (2010). Is strategy different for very small and new firms? *Journal of Small Business Strategy*, 21(2), 1–26.

- Madrid-Guijarro, A., García-Pérez-de-Lema, D., & van Auken, H. (2013). An investigation of Spanish SME innovation during different economic conditions. *Journal of Small Business Management*, 51(4), 578–601.
- Madrid-Guijarro, A., García-Pérez-de-Lema, D. & van Auken, H. (2011). An analysis of non-financial factors associated with financial distress. *Entrepreneurship & Regional Development*, 23(3/4), 159–186.
- Manzanaque, M., García-Pérez-de-Lema, D., & Renart, M. A. (2015). Bootstrap replacement to validate the influen of the economic cycle on the structure and the accuracy level of business failure prediction models. *Journal of Forecasting*, 34(4), 275-289.
- Marques de Sá, J. P. (2007). *Applied statistics using SPSS, STATISTICA, MATLAB and R*. Berlin-Heidelberg: Springer.
- Martin, S. (2012). Market structure and market performance. *Review of Industrial Organization*, 40(2), 87-108.
- McDougall, F. M., & Round, D. K. (1984). A comparison of diversifying and nondiversifying Australian industrial firms. *The Academy of Management Journal*, 27(2), 384-398.
- Metz, C. E. (1978). Basic principles of ROC analysis. *Seminars in Nuclear Medicine*, 8(4), 283-298.
- Morris, M., Schindehutte, M., Richardson, J. & Allen, J. (2006). Is the business model a useful strategic concept? Conceptual, theoretical and empirical insights. *Journal of Small Business Strategy*, 17(1), 27-50.
- Mousavi, M., Zimon, G., Salehi, M., & Stepnicka, N. (2022). The effect of corporate governance structure on fraud and money laundering. *Risks*, 10(9), 176. <https://doi.org/10.3390/risks10090176>
- Mousavi, M. M., & Ouenniche, J. (2018). Multi-criteria ranking of corporate distress prediction models: Empirical evaluation and methodological contributions. *Annals of Operations Research*, 271(2), 853-886.
- Murphy, G., & Tocher N. (2017). Diversification in small firms: Does parental influence matter? *Journal of Small Business Strategy*, 27(3), 25-38.
- Nermuth, M. (1983). Insolvencies and the business cycle in Austria. *Empirica*, 10(2), 159-182.
- Norton, C. L., & Smith, R. E. (1979). A comparison of general price level and historical cost financial statements in the prediction of bankruptcy. *The Accounting Review*, 54(1), 72-87.
- Nunes, P. M., Serrasqueiro, Z. S., & Leitao, J. (2010). Are there nonlinear relationships between the profitability of Portuguese service SME and its specific determinants? *The Service Industries Journal*, 30(8), 1313-1341.
- Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 18(1), 109-131.
- Park, S.-S., & Hancer, M. (2012). A comparative study of logit and artificial neural networks in predicting bankruptcy in the hospitality industry. *Tourism Economics*, 18(2), 311-338.
- Parsa, H. G., van der Rest, J.-P. I., Smith, S. R., Parsa, R. A., & Bujisic, M. (2015). Why restaurants fail? Part IV: The relationship between restaurant failures and demographic factors. *Cornell Hospitality Quarterly*, 56(1), 80-90.
- Parsa, H. G., Self, J., Sydnor-Busso, S., & Yoon, H. J. (2011). Why restaurants fail? Part II – The impact of affiliation, location, and size on restaurant failures: Results from a survival analysis. *Journal of Foodservice Business Research*, 14(4), 360-379.
- Parsa, H. G., Self, J. T., Njite, D., & King, T. (2005). Why restaurants fail. *Cornell Hotel and Restaurant Administration Quarterly*, 46(3), 304-322.
- Pearce, J. A., & Michael, S. C. (2006). Strategies to prevent economic recessions from causing business failure. *Business Horizons*, 49(3), 201-209.
- Peteraf, M. A. (1996). Resource-based theory. In: M. Goold & K. S. Luchs (Eds.), *Managing the multibusiness company: Strategic issues for diversified groups* (pp. 68-92). New York, NY: Routledge.

- Peteraf, M. A. (1993). The cornerstones of competitive advantage: A resource-based view. *Strategic Management Journal*, 14(3), 179-191.
- Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations. A resource dependence perspective*. New York, NY: Harper & Row.
- Philosophov, L. V., Batten, J. A., & Philosophov, V. L. (2008). Predicting the event and time horizon of bankruptcy using financial ratios and the maturity schedule of long-term debt. *Mathematics and Financial Economics*, 1(3), 181-212.
- Piotroski, J. D. (2000). Value investing: The use of historical financial statement information to separate winners from losers. *Journal of Accounting Research*, 38(Supplement), 1-41.
- Platt, H. D., & Platt, M. B. (2008). Financial distress comparison across three global regions. *Journal of Risk and Financial Management*, 1(1), 129-162.
- Platt, H., & Platt, M. B. (2002). Predicting corporate financial distress: Reflections on choice-based sample bias. *Journal of Economics and Finance*, 26(2), 184-199.
- Pohar, M., Blas, M., & Turk, S. (2004). Comparison of logistic regression and linear discriminant analysis: A simulation study. *Metodološki Zvezki*, 1(1), 143-161.
- Pohlman, R. A., & Hollinger, R. D. (1981). Information redundancy in sets of financial ratios. *Journal of Business Finance & Accounting*, 8(4), 511-528.
- Porath, D. (2011). Scoring models for retail exposures. In B. Engelmann, & R. Rauhmeier (Eds.), *The Basel II risk parameters: Estimation, validation, stress testing – with applications to loan risk management* (pp.25-36). Berlin-Heidelberg: Springer.
- Porter, M. E. (1999). Michal Porter on competition. *The Antitrust Bulletin*, 44(4), 841-880.
- Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal*, 12(Special Issue: Fundamental Research Issues in Strategy and Economics), 95-117.
- Porter, M. (1987) From competitive advantage to corporate strategy. *Harvard Business Review*, 65(3), 43-59.
- Poston, K. M., Harmon, K. W., & Gramlich, J. D. (1994). A test of financial ratios as predictors of turnaround versus failure among financially distressed firms. *Journal of Applied Business Research*, 10(1), 41-56.
- Pozzoli, M., & Paolone, F. (2017). *Corporate financial distress: A study of the Italian manufacturing industry*. Cham: Springer Verlag.
- Pretorius, M. (2009). Defining business decline, failure and turnaround: A content analysis. *The Southern African Journal of Entrepreneurship and Small Business Management*, 2(1), 1-16.
- Pretorius, M. (2008). Critical variables of business failure: A review and classification framework. *South African Journal of Economic and Management Science*, 11(4), 408-430.
- Priem, R. L., & Butler, J. E. (2001). Is the resource based “view” a useful perspective for strategic management research? *Academy of Management Review*, 26(1), 22-40.
- Pulido-Fernández, J. I., & Cárdenas-García, P. J. (2021). Analyzing the bidirectional relationship between tourism growth and economic development. *Journal of Travel Research*, 60(3), 583-602.
- Ragab, Y.M., & Saleh, M.A. (2022). Non-financial variables related to governance and financial distress prediction in SMEs—evidence from Egypt. *Journal of Applied Accounting Research*, 23(3), 604-627.
- Ritchie, B. (2005). Longitudinal research methods. In B. W. Ritchie, P. Burns & C. Palmer (Eds.), *Tourism research methods: Integrating theory with practice* (pp.131-148). Oxford, UK: CABI Publishing.
- Rumelt, R. P. (1982). Diversification strategy and profitability. *Strategic Management Journal*, 3(4), 359-369.
- Sehgal, S., Mishra, R.K., Deisting, F., & Vashisht, R. (2021). On the determinants and prediction of corporate financial distress in India. *Managerial Finance*, 47(10), 1428-1447.
- Serrasqueiro, Z. S., & Nunes, P. M. (2008). Performance and size: Empirical evidence from Portuguese SMEs. *Small Business Economics*, 31(2), 195-217.

- Sheppard, J. P. (1994). Strategy and bankruptcy: An exploration into organizational death. *Journal of Management*, 20(4), 795-833.
- Situm, M., Märk, S., & Kathan, M. (2021). The use of management accounting in Western Austrian family businesses: An empirical analysis. *Corporate Ownership & Control*, 18(S3), 379-394.
- Situm, M. (2016). The divergence between corporate success and crisis: The separability of recovered and healthy companies. *The MacrotHEME Review*, 5(4), 49-80.
- Spanos, Y. E., Zaralis, G., & Lioukas, S. (2004). Strategy and industry effects on profitability: Evidence from Greece. *Strategic Management Journal*, 25(2), 139-165.
- Statistik Austria (2021). *Urban-Rural-Typologie: Stand 2021 – Methodik*. Vienna: Statistik Austria.
- Stiglitz, J. E., & Weiss, A. (1991). Credit rationing in markets with imperfect information. *American Economic Review*, 71(3), 393-410.
- Thorelli, H. B. (1996). Networks: Between markets and hierarchies. *Strategic Management Journal*, 7(1), 37-51.
- Thornhill, S., & Amit, R. (2003). Learning about failure: Bankruptcy, firm age, and the resource-based view. *Organization Science*, 14(5), 497-509.
- Tsai, H., Song, H., & Wong, K. K. F. (2009). Tourism and hotel competitiveness research. *Journal of Travel & Tourism Marketing*, 26(5/6), 522-546.
- Turetsky, H. F., & McEwen, R. A. (2001). An empirical investigation of firm longevity: A model of the extant predictors of financial distress. *Review of Quantitative Finance and Accounting*, 16(4), 323-343.
- Upneja, A., & Dalbor, M. C. (2001). An examination of capital structure in the restaurant industry. *International Journal of Contemporary Hospitality Management*, 13(2), 54-59.
- Viana Jr, D.B.C., Lourenço, I., & Black, E.L. (2022). Financial distress, earnings management and Big 4 auditors in emerging markets. *Accounting Research Journal*, 35(5), 660-675.
- Vivel-Búa, M., & Lado-Sestayo, R. (2021). Contagion effect on business failure: A spatial analysis of the hotel sector. *Journal of Hospitality & Tourism Research*, doi.org/10.1177/10963480211023804.
- Vivel-Búa, M., Lado-Sestayo, R., & Otero-González, L. (2016). Impact of location on the probability of default in the Spanish lodging industry: A study of MSMEs. *Tourism Economics*, 22(3), 593-607.
- Whitaker, R. B. (1999). The early stages of financial distress. *Journal of Economics and Finance*, 23(2), 123-133.
- Williams, D. A. (2014b). Resources and business failure in SMEs: Does size matter? *Journal of Business and Management*, 20(2), 89-10.
- Williams, D. A. (2014a). Resources and failure of SMEs: Another look. *Journal of Developmental Entrepreneurship*, 19(1), 1-15.
- Wilson, S., Fesenmaier, D. R., Fesenmaier, J., & van Es, J. C. (2001). Factors for success in rural tourism development. *Journal of Travel Research*, 40(2), 132-138.
- Wilson, T. A. (1992). An analysis of the profitability of businesses of diversified companies. *Review of Industrial Organization*, 7(2), 151-185.
- Yazdanfar, D., & Öhman, P. (2020). Financial distress determinants among SMEs: Empirical evidence from Sweden. *Journal of Economic Studies*, 47(3), 547-560.
- Youn, H., & Gu, Z. (2010). Predict US restaurant firm failures: The artificial neural network model versus logistic regression model. *Tourism and Hospitality Research*, 10(3), 171-187.
- Zhai, S.-S., Choi, J.-G., & Kwansa, F. (2015). A financial ratio-based predicting model for hotel business failure. *Global Business & Finance Review*, 20(1), 71-86.

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