

Review

A Literature Review on the Financial Determinants of Hotel Default

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Abstract: Empirical corporate failure studies focusing on specific economic activities are increasing in number, as this path can be a more precise investigation of default, although still there is a gap in the literature reviews at the sector level. The purpose of this study is to focus on the hotel sector and isolate the financial determinants linked to hotel default, as the approach of accounting-based models is the most frequent practice. To arrange the variety of outputs, a thorough design is applied based on specific inclusion and exclusion criteria, leading to 29 studies, which are further narrated, focusing mainly on the financial dimension. In addition, information on the study design is recorded in an aggregated table. The most frequent stylized results show that debt and liability measures increase the default risk, while measures of profitability and size in terms of total assets reduce the risk. This review addresses the calls for a sectoral focus and provides an up-to-date financial overview of hotel default assessments. It further aims to benefit academia, as it can act as a base for further development, as well as stakeholders involved in the financial sustainability of the hotel sector.

Keywords: hotel bankruptcy; hotel failure; hotel survival; financial distress; default



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1. Introduction

Empirical research on corporate failure is a vast field due to the interest of researchers and stakeholders in better understanding the determinants connected to business cessation. As studies are performed for aggregated but also for segregated business sectors, the latter is believed to be a more detailed investigation (Sun et al. 2014), and as this type of literature gathers pace, there is a need to accumulate and update such research evidence by sector. This view becomes more salient because specific sectors may benefit an economy in terms of employment, taxation and gross domestic product formation.

Many distinct sectors have been under the lens of corporate failure, for example, construction companies (Abidali and Harris 1995; Acosta-González and Fernández-Rodríguez 2014; Alaka et al. 2017), airlines (Espahbodi and Espahbodi 1984; Gudmundsson 2004) and hospitals (Enumah and Chang 2021), and many researchers have suggested such research by sector (Adams 1991; Altman 1971; Cultrera and Brédart 2016; Giannopoulos and Sigbjørnsen 2019; McGurr and DeVaney 1998; Sun et al. 2014; Vezanzones and Severin 2021; Vivel-Búa et al. 2016) or size (Altman and Sabato 2007; Edmister 1972; Gupta et al. 2018).

Different paradigms applying various methods and types of variables exist in the firm failure literature. According to Cultrera and Brédart (2016), the financial ratio approach is one of the four prominent approaches, besides the economic, the strategic and the organizational and managerial approaches. Mellahi and Wilkinson (2004) and Amankwah-Amoah et al. (2021) classify this broader stream on a slightly different theoretical base. On the one side lies the deterministic view, applied mainly by the industrial organization and organizational ecology schools of thought, which assume the reasons for failure to be external to the firm and related to the industry and the environment. The opposite view, the voluntaristic approach, is used in organization studies and by organizational psychology and assumes that the causes of failure are rooted within the firm (Mellahi and Wilkinson

2004) in the form of internal factors such as strategy, capabilities and resources (Heracleous and Werres 2016).

Despite the aforementioned theory-based approaches, the financial ratio strand is the most frequently used approach (Veganzones and Severin 2021) and can claim its partial intersection with the financial resources fragment of the voluntaristic paradigm. A bridging rationale to comprehend corporate failure and default from a financial perspective is that as firms enter the last stages of the failing process, the increasing internal deterioration of their organization and structure gives rise to clear failure symptoms mainly visible in financial statements (Crutzen and van Caillie 2008; Moncarz and Kron 1993), which can include shrinking financial resources as negative profitability (Mellahi and Wilkinson 2004) or increased debt. Veganzones and Severin (2021) share this view and add that these factors are predictable too.

This financial deterioration can be seen as the financial antecedents or symptoms of failure, although not necessarily as the real causes (Li et al. 2021). Identifying the causes of failure may require multidimensional in-depth data such as case studies, interviews or questionnaires (Carter and Auken 2006; Madrid-Guijarro et al. 2011; Mellahi and Wilkinson 2004), as the causes are rooted, at least from the voluntaristic perspective, in aspects of management, and transmitted via the corporate governance channel (Almaskati et al. 2021; Li et al. 2021), or they may require a combination of internal and external factors (Mellahi and Wilkinson 2004), where for the latter firms have no control.

As already stated, the financial ratio approach, although considered atheoretical and data-driven (Jayasekera 2018), is the most prevalent approach, and it is able to capture efficiently the financial dimension of failure and identify with high precision the financial clauses of failure. It coincides with corporate failure prediction or bankruptcy prediction, where two basic research trends exist: the investigation of failure in order to find the symptoms or the performance comparison of different methodologies (Kim 2011; Tseng and Hu 2010).

Depending on the methodology applied, the financial approach can provide comprehensive information about the participation, importance, and effect of certain financial inputs. This is mainly performed on a methodological structure that best classifies the sample of failed to non-failed firms based on their financial characteristics. As such, bankruptcy prediction modeling can act as a canary in a coal mine, offering early warning indicators of firm default, can highlight the role of specific accounting items and can lead to useful economic inferences.

The financial information can be found in the financial statements of firms, and with the dissemination of relevant databases, researchers are able to reach the micro-firm level, thus having the opportunity to examine the whole firm universe of an economic activity, in contrast to the past, where such information was limited only to large and listed firms. Pure financial models can be constructed with rather less cost than other approaches, as they combine only secondary data, i.e., financial ratios and default events, where on many occasions both are provided from the same source.

Although all the approaches for researching firm failure have their own merits and should not be viewed as competitive but rather as substitutive and necessary to understand the whole failure phenomenon, the financial approach has a distinctive trait. It allows for certain robustness exercises unique to bankruptcy prediction, which are not practiced in the other streams, namely the extension of the default horizon, a technique that provides robust evidence about the stability and the information content of ratios over time.

Regarding the state of the literature reviews on corporate failure, at least 19 can be located (Alaka et al. 2018; Appiah et al. 2015; Aziz and Dar 2006; Balcaen and Ooghe 2006; Bellovary et al. 2007; Dimitras et al. 1996; Garcia et al. 2022; Habib et al. 2020; Hernández et al. 2021; Kim et al. 2020; Kirkos 2015; Kristóf and Virág 2020; Nguyen and Zhou 2023; Pretorius 2008; Prusak 2018; Ravi Kumar and Ravi 2007; Shi and Li 2019; Sun et al. 2014; Veganzones and Severin 2021) that discuss various aspects, albeit not from a sectoral stance. This can be perceived as the first general gap in the broader literature.

Although the first attempts to study tourism and hospitality firm failure using financial ratios can be traced back to the 1990s (Adams 1991; Moncarz and Kron 1993), regarding the further evolution of this sub-strand, Thomas et al. (2011) commented that failure studies were generally absent for small businesses in the tourism context. Relatively recent reviews of hospitality financial management (Jang and Park 2011; Tsai et al. 2011) have dedicated sections to firm bankruptcy, but at the time, the number of studies was more limited. More recently, Lado-Sestayo et al. (2016), Vivel-Búa et al. (2016), Falk and Hagsten (2018), Situm (2023) and Caires et al. (2023) included literature review sections in their empirical work on hotel failure and presented cumulative tables of relevant studies, while Spyridou (2019) provided a conceptual approach regarding the same issue. The scope of discussing and presenting the literature in these six studies is not exhaustive on the nexus of financial factors and hotel default; rather, they included all the factors affecting tourism or hospitality firm defaults. As is going to be discussed in the next sections, hotel default studies involving financial data are increasing and have received over 1000 citations, although to the best of our knowledge, no systematic previous attempt exists to accumulate the sector's evidence. This derivation can be perceived as another gap, this time in the hotel-specific literature.

Having set the underpinnings of the general-specific deficit in sectoral reviews on firm default, and in light of the fact that the finance approach is the most frequent in the hotel sector too, this gap becomes the starting point to conduct such a literature review. Thus, the main research question can be articulated as follows: Which financial ratios are recorded in the literature to be related to hotel default and what is their effect?

The next section will present empirical arguments regarding the motivation for sectoral default research, which is followed by the Materials and Methods section that describes the procedure followed to reach the final set of studies. The next section narrates the studies, followed by a discussion of the main results, and the review concludes with the implications, limitations and future research paths.

2. Firm Failures in the Hotel Industry: Motivation for Sectoral Research

As the hotel industry is traditionally viewed as a capital-intensive and fixed asset-intensive sector, this suggests that differences may exist in the financial metrics across sectors. For example, Altman and Sabato (2007) noted the high variability of financial ratios between the real estate and agriculture sectors in the US. Singal (2015) found higher leverage for listed hospitality firms compared to other US industries by 9.8%, as also did Kim (2018) for the same market. Similarly, Crespi-Cladera et al. (2021) identified considerably higher financial leverage for the entire Spanish hotel sector compared to other business groups. The average earnings before interest and tax (EBIT) per size band was found to differ among hotels in four Mediterranean countries (Dimitrić et al. 2019), while the whole accommodation sector in Portugal exhibited high deviations in the debt and fixed assets compared to other tourism sectors (Caires et al. 2023).

There is also much empirical evidence that the determinants of failure can vary for different sectors of the economy (Caires et al. 2023; Chava and Jarrow 2004; Dong et al. 2018; du Jardin 2015; Izan 1984; Kim 2018; Platt and Platt 1990, 2002; Tomas Žiković 2018), and this empirical fact can hold even for subsectors, for example, for the subsectors of the listed US manufacturing industry (Topaloğlu 2012). In the hospitality field, Cho (1994) and Kim (2018) found different ratios prevailing among hotels and restaurants in respect to default.

In terms of failures, many studies have reported high percentages of firm failures in the hospitality industry in various countries (Abidin et al. 2020; Boer 1992; Chathoth et al. 2006; Pisula 2020; Situm 2023; Solnet et al. 2010; Westgaard and van der Wijst 2001). An increased bankruptcy risk for the hotel sector may arise after the end of the COVID-19 period, as projected recently in a few studies (Crespi-Cladera et al. 2021; Matejić et al. 2022; Špiler et al. 2022), as also due to the current energy and cost of living crises.

In an ideal research design environment, firm samples should be as homogenous as possible (Altman 1971; Kim 2018), as using mixed samples, even from the hospitality

industry, which based on the industry standard classification systems include the economic activities of both accommodation and food services, can lead to cross-sector influence (Barreda et al. 2017; Caires et al. 2023; Li and Huang 2012). An obstacle to this direction can be the limited number of actual firm failures (Li and Sun 2012; Veganzones and Severin 2021), as failures are rare events and data can be scarce. This fact can prohibit generating low p-values (Kalnins 2016), although with increasing data quality and the ability of methods to handle small numbers of default events (e.g., Ho et al. (2013) use 12 default events and Sandin and Porporato (2008) use 11), these issues are gradually surpassed. On the other hand, del Castillo García and Fernández Miguélez (2021) and Laguillo et al. (2019) question sector-specific models, as a sectoral approach can increase the costs of development and further maintenance and may not increase the accuracy significantly.

Merging the previous main points, it can be argued that as the financial ratios per sector vary, the sectoral determinants of failure and sector risk can vary too. This line of reasoning creates an incentive to focus more on specific sectors, as sectors are not equally responsive to certain ratios. This type of research becomes more feasible as the means of conducting such research become more available.

3. Materials and Methods

This section describes the procedure followed in order to reach the final eligible collection of studies. Initially, an advanced search is performed in Google Scholar, which has wide coverage, with relevant terms and key phrases, which are the jargon found in the literature. This term search is performed for all the length of the text, for studies in the English language and with no year restriction. The intention is to retain quality full papers, book chapters and doctoral theses while excluding extended abstracts, working papers and conference papers.

Three combinations of keywords are applied in order to flank the essential content more efficiently. The rationale for using different combinations is to safeguard against term overlapping across studies and missed content due to using a single algorithm¹. Each combination has two technical components. The first is one of the three exact phrases, “hotel bankruptcy”, “hotel failure” and “hotel survival”, which are expected to be present in the studies of interest. Having these three exact phrases as a cornerstone, the second part involves the search for at least one alternative word related to the hotel sector, such as accommodation, lodging, hospitality and tourism, as well as terms proxying different financial aspects of firm failure, such as default, distress, insolvency, survival and risk. The three exact keyword combinations are:

1. “hotel bankruptcy” accommodation OR lodging OR hospitality OR tourism OR default OR distress OR insolvency OR survival OR risk.
2. “hotel failure” accommodation OR lodging OR hospitality OR tourism OR bankruptcy OR default OR distress OR insolvency OR survival OR risk.
3. “hotel survival” accommodation OR lodging OR hospitality OR tourism OR bankruptcy OR default OR distress OR insolvency OR risk.

Table 1 depicts the research framework of the study, where column one names the different steps of the process, columns two to four involve the number of studies added or subtracted per combination and column N represents the sum of the remaining studies after each step.

The three combinations, which are placed in the first line of Table 1, retrieve 208, 194 and 222 studies, respectively², resulting in a total of 624 items. Then, several exclusion criteria are applied. The first phase involves the initial screening of the abstract and introduction of every item for a generic relevance match. In this stage, 550 studies are removed due to either being related to law, service failure or business strategy or being irrelevant. The remaining 74 results are stored in online labels and then extracted to spreadsheets for further data manipulation. The next step removes 25 duplicates and 1 extended abstract (Álvarez-Ferrer and Campa-Planas 2020), and the remaining 48 unique entries are merged into 1 file.

Table 1. Research framework of the study.

Step of the Process	Combination 1	Combination 2	Combination 3	N
Studies retrieved	208	194	222	624
Initial screening (minus)	−178	−168	−204	74
Duplicates and abstracts (minus)	−2	−9	−15	48 *
In-depth screening (minus)		−25		23
WoS and Scopus (minus)		−3		20
Subjective inclusion (plus)		+9		29

* From this step forward, all the studies are merged.

The next phase reviews the whole articles in depth. As the prime interest of the study is to record the effects of financial variables relevant to failure, studies belonging to the strands of industrial organization, organizational ecology and organizational psychology, after been reviewed, are sorted out (Baum 1995; Baum and Haveman 1997; Baum and Ingram 1998; Baum and Lant 2003; Baum and Mezias 1992; Ingram and Baum 1997a; Ingram and Inman 1996; Kalnins 2016; Urtasun and Gutiérrez 2006), as these studies model hotel failures, with the firm metrics usually being age and size, with the latter measured in the hotel environment in terms of room capacity, which is consistent with the norms and tradition of that strand of literature (Mellahi and Wilkinson 2004; Ropega 2011). In addition, the qualitative study of Lowe (1988) is removed.

As another aim is to keep works that provide clear-cut hotel results, studies using broader tourism or hospitality firm samples inseparably and in an indistinguishable manner are not included (Abidin et al. 2020, 2021; Barreda et al. 2017; Laguillo et al. 2019; Li et al. 2017, 2019; Park and Hancer 2012; Pisula 2020). Another sub-filter regarding study relevance is the exclusion of ex ante bankruptcy risk assessments that do not deal with actual bankruptcies or a measure of financial distress, where the aim is to project a future potential credit profile for hotels (Gallo et al. 2018; Matejić et al. 2022; Špiler et al. 2022; Vivel-Búa et al. 2018). Studies dealing explicitly with the going concern issue (Fernández et al. 2018; Zhai et al. 2015) and a recent study where the only financial metric, the initial injected capital, which can be considered a balance sheet item, was not promoted in the final model (Yuan et al. 2023), are excluded too. In total, the in-depth screening filter removed 25 studies.

The following criterion is applied to ensure the quality of the remaining studies. For this reason, the studies are cross-checked in the databases of Scopus and the Core Collection of Web of Science, aiming for a presence in at least one of these databases. This filter excludes three more studies (Choi and Lee 2014; Nagendrakumar et al. 2020; Waikar and Fernandes 2020).

The final stage allows the subjective inclusion of nine studies (Adams 1995; Cho 1994; Correia et al. 2022; Fernández-Gámez et al. 2016; Gu and Gao 2000; Piacentino et al. 2021; Türkcan and Erkuş-Öztürk 2020; Vivel-Búa et al. 2016; Youn and Gu 2010) that are mainly assembled through the previous literature, extended research, cross-referencing and from database suggestions such as Science Direct and Mendeley. Seven studies are from peer-reviewed journals and cover all the prerequisites of the previous filters. The study by Correia et al. (2022), although it does not sample hotels in the sense of the NACE 5510 code but only the rest of the subcodes designated to accommodation, is still retained. The book chapter by Adams (1995) and the thesis by Cho (1994), although not indexed in Web of Science or Scopus, due to their pivotal and historical importance in the field, are included. Such subjective inclusion measures beyond a predefined algorithm are not unusual in literature reviews (e.g., Kirkos 2015; Song et al. 2019).

The final set of studies is narrowed down to 29, which based upon recent research in Google Scholar, altogether have received 1211 citations and are published in 15 journals. Table 2 presents the journals where the collected papers (except the book chapter and the thesis) appear³.

Table 2. Frequency of publications per journal.

Journal	Count
<i>Applied Economics</i>	1
<i>European Journal of Tourism Research</i>	1
<i>International Journal of Accounting and Financial Reporting</i>	1
<i>International Journal of Contemporary Hospitality Management</i>	1
<i>International Journal of Hospitality Management</i>	4
<i>International Journal of Tourism Cities</i>	1
<i>Journal of Forecasting</i>	1
<i>Journal of Hospitality & Tourism Research</i>	3
<i>Services Business</i>	1
<i>Spatial Economic Analysis</i>	1
<i>Sustainability</i>	2
<i>The Services Industries Journal</i>	1
<i>Tourism and Hospitality Research</i>	1
<i>Tourism Economics</i>	2
<i>Tourism Management</i>	4
<i>Tourism & Management Studies</i>	2
Total	27

The material is then deconstructed into basic elements (Torraco 2005) and presented in Table A1 placed in Appendix A, in the exact sense of Table 2 from Lado-Sestayo et al. (2016, p. 21), with the only variation being the addition of the definition of default used. This addition is made because the criterion of failure can have major implications for the results (Balcaen and Ooghe 2006; Pretorius 2009), as it defines the dependent variable. The information is further organized into alphabetical and chronological order and the table is consisted of seven columns. The first column has the author information, the second the country field of the research and the third the period of study. The fourth column gives the sample information in terms of listed or private hotels, as well as the proportions of the failed, non-failed or whole hotel population. The fifth column presents the definition of default used, and the sixth column lists the methodological specifications. The seventh column includes the main financial results per study. The results are mainly composed of the decisive financial variables, meaning the variables promoted in the final presented models. For the multivariate discriminant analysis (MDA) and artificial intelligence (AI) methods, no sign effects are presented, only the inclusion of variables, as these methods do not provide such inferences (Altman and Sabato 2007; Kim 2018) as happens for econometric models, where a positive or negative effect toward failure is provided. As several studies apply a survival analysis and may report the determinants of survival, the interpretation is adjusted appropriately to reflect the relationship to exit and, generally, to hotel failure.

Based upon the extracted data, the studies are parsimoniously narrated in a geographical manner, focusing mainly on financial variables. In the narration, attention is given to keeping the exact same terminology as the original source and explaining, when fully given, the composition of the financial ratios in order to enhance clarity and intelligibility (Dolnicar and Chapple 2015), as it is not uncommon in the literature for ratios to be phrased differently (Lukason and Andresson 2019). Table 3 presents how the studies are distributed across continents and countries.

Table 3. Studies per continent and country.

Continent	Country	No. of Studies
Europe	Austria	1
	Greece	1
	Italy	1
	Norway	1
	Portugal	2
	Spain	11
	Sweden	1
	UK	1
Asia	China	2
	Korea	2
	Taiwan	1
	Turkey	1
Americas	U.S.A.	4
Total		29

4. Narration of Studies by Continent

4.1. Europe

The narration begins with the studies that originate in Europe, where most research is conducted. [Adams \(1995\)](#) applied an MDA and two versions of [Altman's \(1968\)](#) Z-score model, with the original set of financial variables of working capital to total assets, retained earnings to total assets, EBIT to total assets, sales to total assets and market value of equity to book value of debt, and evaluated the performance of four listed UK hotels, classifying correctly the three occurrences of suspensions. [Diakomihalis \(2012\)](#) also used the MDA method with three versions of [Altman's \(1968\)](#) models for the Greek hotel market. The model calibrated on manufacturing firms scored best at 88%, followed by the private firm model with 83% and the services model with 80%.

A significant proportion of the research comes from the Iberian Peninsula, mainly Spain, where [Gémar et al. \(2016\)](#) applied a Cox proportional hazard model and evaluated external and internal factors. The financial factor reducing the risk was found to be the profit margin ratio as the pre-tax profit to operating revenue, while management practices as the ratio of employee costs to operating revenue being over 43% increased the risk. [Gemar et al. \(2019\)](#) extended the previous study, this time for resort hotels, where the same ratio of employee costs to operating revenue appeared to increase the risk. [Escribano-Navas and Gemar \(2021\)](#) examined financial variables as well as the CEO gender dimension. The results showed that size as the natural logarithm of the net sales and performance as the net income to total assets reduced the risk of exit, while the ratio of working capital to total assets to proxy liquidity appeared to increase the risk.

Another research team of [Lado-Sestayo et al. \(2016\)](#) used survival analysis to investigate financial as also external factors and found that the firm-level variables, profitability as the operating net income to total assets, financial balance as the equity to current liabilities, liquidity as the net operating cash flow to total assets and size in terms of the logarithm of total assets, all reduced the probability of exit, while the economic structure as the current assets to total assets had the opposite effect. [Vivel-Búa et al. \(2016\)](#) compared the logit and probit to predict hotel bankruptcy, and the financial variables increasing the probability of default were found to be indebtedness as the total liabilities to total assets and the economic structure as the current assets to total assets. Profitability as represented by the operating income to total assets, financial balance as the equity to current liabilities, overall activity as

the net turnover to total assets and size as the total assets reduced the probability of default, while logit proved marginally better than probit.

The same research team of [Vivel-Búa et al. \(2019\)](#) examined the likelihood of financial insolvency for a large sample of micro, small and medium-sized hotels. With four specifications of survival models, the results showed that a positive effect on survival is related to performance as the net income to total assets, the cash flow to total sales ratio and asset turnover as the net sales to total assets, in contrast to debt as the total liabilities to total assets and size as the total assets, the latter though having a smaller effect for micro hotels. [Vivel-Búa and Lado-Sestayo \(2023\)](#) examined conjointly financial and destination related variables as also a temporal contagion effect. The probit analysis showed that size as represented by the logarithm of the total assets and asset efficiency as the income to total assets had a negative effect on failure.

The narration remains in Spain with [Fernández-Gómez et al. \(2016\)](#), who compared the multi-layer perceptron (MLP) and probabilistic neural network (PNN) methods, with one- to three-year horizons ahead of bankruptcy. The MLP model performed 95, 93 and 90% for the three horizons, respectively, and PNN followed with a difference of less than 2% for all the time windows. Based on the sensitivity of the more transparent PNN model, the ratio of earnings before interest, taxes, depreciation and amortization (EBITDA) to current liabilities as the net profit margin, liabilities to net worth, total liabilities to total assets and the account receivable turnover ratio as the sales to account receivables were selected as the most influential metrics, while the two- and three-year models promoted a different mix of variables. The study by [Pelaez-Verdet and Loscertales-Sanchez \(2021\)](#) found the return of capital employed (ROCE) ratio, which consisted of the EBIT plus financial expenses divided by the shareholders' equity plus fixed liabilities, as the sole predictor increasing the exit prospects for small-sized Spanish hotels.

[del Castillo García and Fernández Miguélez \(2021\)](#) examined a broad Spanish tourism firm sample of 406 firms, where 138 were hotels. MLP was used with the financial ratio inputs derived from various studies related to bankruptcy in the tourism sector. The hotel-focused model, which reached over 90% accuracy, selected as the most sensitive predictors the return on assets (ROA) as the EBIT to total assets, return on equity (ROE) as the net profit to net equity, net profit margin as the net profit to turnover, liabilities coverage as the EBITDA to current liabilities, free cash flow as the cash flow to total liabilities, the current ratio as the current assets to current liabilities, efficiency as the turnover to total assets and leverage as the total liabilities to total assets, while the global model performed slightly better with a different mix of variables. [Maté-Sánchez-Val \(2021\)](#) tested the probability of financial distress for non-multinational hotels with neighboring Airbnb listings for the city of Barcelona. A logit model estimated a negative effect on distress to be related to size in terms of the logarithm of total assets and profitability as the profits before interest and taxes to total assets.

Moving out of Spain, [Correia et al. \(2022\)](#) used a probit model for Portuguese accommodation and found that the net income to total assets, sales to total assets and retained earnings to total assets reduced the probability of failure, while the opposite held for the current assets to total assets. [Caires et al. \(2023\)](#) researched the survival determinants among various Portuguese sectors, including tourism firms and hotels, with a discrete-time survival model. The hotel and rest of the accommodation models showed a reduced exit hazard for the logarithm of sales, operating profit to total assets and for fixed assets to total assets, while the debt to total assets had an increased effect. For Italy and specifically the island of Sicily, [Piacentino et al. \(2021\)](#) examined the survival determinants of newly established accommodation firms with a Cox regression. The only financial metric found to decrease the risk was size as the sales turnover at the first year of operation, while no difference in risk was found between hotels and other types of accommodation sampled, meaning hostels and camping sites.

The last three European studies were performed in northern territories, beginning with Scandinavia and Norway, where [Zhang and Xie \(2023\)](#) showed that the retained

earnings to total assets and the book value of equity to total liabilities reduced the exit hazard. In Sweden, [Falk and Hagsten \(2018\)](#) examined the exit for urban and non-urban accommodation and showed that longevity was increased with price levels as the logarithm of the revenues to overnight stays. Lastly, for Austria, [Situm \(2023\)](#) investigated with logit the financial distress of hotels and restaurants, involving financial but also destination and macroeconomic information. The financial variables reducing hotel distress were found to be size as the logarithm of total assets, EBIT to total assets and total equity to total assets, while the dummy variable representing negative equity, taking the value of one if the total debt is higher than the total assets, had a positive influence on distress.

4.2. Asia

The narration continues to studies performed in Asia, with [Youn and Gu \(2010\)](#), who compared logit and neural networks (NN) for public Korean lodging companies. The interest coverage ratio measured as the EBIT to interest expenses was selected as the best predictor in the one variable logit, with a protective role in relation to failure. The four-variable NN model, was selected in addition to the current ratio as the current assets to current liabilities, the quick ratio as the quick assets to current liabilities and EBITDA to current liabilities. Overall, the NN reached a better accuracy in- and out-of-sample by 4%.

[Kim \(2011\)](#) employed four different modelling approaches, MDA, logit, NN and support vector machine (SVM), for Korean hotels. The SVM method scored the best accuracy of 95%, having selected seven variables: return on equity, current ratio, fixed asset turnover, fixed assets to long-term capital ratio, ordinary income to owner's equity ratio, growth in owner's equity and growth in assets. In terms of accuracy, the NN followed with 91%, logit with 80% and MDA with 72%. For Taiwan, [Chen and Yeh \(2012\)](#) found that the hotel failure and labor productivity measured as the average operating revenue per employee appeared to reduce the probability of failure.

[Li and Sun \(2012\)](#) compared the MDA, logit, NN and SVM for listed Chinese tourism firms with hotel businesses and the [Altman \(1968\)](#) set of variables. Due to the small sample size, the nearest neighbor up-sampling technique was applied to augment technically the sample. The research showed that the up-sampling approach increased the accuracy of all the models and that the SVM performed best. In a similar vein and using the [Altman and Hotchkiss \(2005\)](#) variables, identical conclusions were reached by [Li and Sun \(2013\)](#), where the more advanced case-based reasoning ensemble method performed better. Finally, [Türkcan and Erkuş-Öztürk \(2020\)](#) analyzed hotel, travel agency, restaurant and spa firm exits for the Antalya region in Turkey by considering firm, district and macro variables. With a discrete-time hazard model, it was estimated that size, as a dummy variable taking the value of one in the case of medium and large firms according to the initial capital, reduced the risk of exit.

4.3. United States

The focus shifts now to the US and the thesis by [Cho \(1994\)](#), where a logit model of listed hotels identified the cash flow per share as the unique predictor with a negative relationship to default and predicted also up to a three-year horizon, reaching 92, 86 and 75% classification accuracies, respectively. [Gu and Gao \(2000\)](#) used the MDA for the broader hospitality market, with eight hotels participating. The model selected the debt ratio of the total liabilities to total assets, the fixed asset turnover ratio of sales to fixed assets, EBIT to current liabilities, gross profit margin as the gross profit to sales and long-term liabilities to total assets and reached an overall accuracy of 93%. For the hotel group, only one out of the four failed hotels sampled, the Prime Motor Inn, was misclassified.

[Kim \(2018\)](#) used an ensemble method, combining traits of the decision trees, NN and SVM for the listed hospitality market. The hotel-only model selected the debt-to-equity ratio, the stock price trend and the accounts receivable turnover as the sales to accounts receivable and attained 95.6% overall accuracy. Lastly, for the US, [Lin and Kim \(2020\)](#)

examined the relationships among the failure rates of Texan hotels taking account of the ownership structure and proved that the logarithm of revenues reduced the risk.

5. Discussion

As the financial characteristics of firms and the default risk per sector can vary, it is believed that empirical studies researching default for segregated economic activities can provide information more adjusted to the sector under study. Although such research at the economic activity level is growing, a general gap is identified regarding reviews of the literature at the industry level, as well as a more specific gap for the hotel sector.

For this reason, a systematic procedure took place in order to identify relevant studies examining the relationship between financial ratios and hotel default. Through a selection procedure, 29 studies are collected and presented, focusing mainly on the financial aspect of default. Where possible, the effect is isolated and recorded too. With these treatments, the main research question is addressed. In addition, a cumulative table with the basic research design of the studies is provided in Table A1 in Appendix A.

Based on the extraction of the most important financial ratios from the studies assembled, some recurrent results can be discussed. Initially, the classic Altman (1968) set of variables used in four studies seems to provide very reliable accuracies, as it is able to capture many fundamental financial dimensions from almost all the ratio categories. Moreover, it can be easily concluded that the metrics representing profitability, income, cash flow, earnings, efficiency and generally revenues have a negative relationship with hotel failure. Leverage in the form of liabilities, debt, or negative equity tends to have a positive influence on default. Cathcart et al. (2020) stated that for private non-listed firms, leverage is possibly the most significant factor enhancing default. These two main facts for revenues and leverage, i.e., hotel default is a decreasing function of revenues and an increasing function of leverage, can be considered as ubiquitous empirical regularities in line with economic logic and intuition.

The financial dimension of size in terms of the total assets, usually met in a logarithmic form, is found in five out of six studies, except in Vivel-Búa et al. (2019), to have a negative effect on default. The same effect also stems from an increased initial capital (Türkcan and Erkuş-Öztürk 2020). The fixed asset turnover ratio participates in only two studies in this review, although due to the methods used, no positive or negative effect can be attached with certainty. The limited participation of ratios related to the fixed assets can be considered a kind of shortfall in a fixed asset-intensive sector.

Regarding listed hotels, six studies have sampled this segment. For market metrics, i.e., metrics available only for listed firms, besides the participation of the stock price trend in Kim (2018) and of the market value of equity in the studies using the Altman (1968) set, the cash flow per share was further observed as having a protective effect on failure (Cho 1994). Most studies have sampled private hotels, and more recently, the whole economic activity of accommodation has been researched in terms of large samples, a practice more adjusted to real-world conditions, as listed hotels represent a minority. Regarding the definitions of default, the legal bankruptcy measure is the most frequent, followed closely by measures of financial distress.

Method-wise, the survival analysis seems to take over in the econometric field, being the basic method of analysis in 11 studies. Logit and probit follow, as in seven occasions they are the unique methods. AI has an increasing presence and the biggest diversity, and when competing to statistical methods, performs in most cases marginally better. Finally, comparisons of different methodologies are conducted in six studies.

Implications, Limitations and Future Research

In general, the basic implication for management stemming from the empirical results of the default studies, according to Cultrera and Brédart (2016), is to closely monitor the evolution of the most important ratios. As leverage in the form of liabilities was found to be the most frequent measure affecting positively hotel default, this fact implies that liabilities

should be continuously controlled and, where possible, mitigated. [Min et al. \(2009\)](#) proposed the continuous improvement of the debt ratio as a suitable survival strategy. Regarding size in the form of the total assets, the protective effect in relation to failure implies that hotels tend to benefit from growth in assets and possibly reach economies of scale.

Some policy implications that can be derived from the findings include provision for the establishment of schemes able to affect appropriately these metrics. Creating employment or renovation schemes, which can reduce the base cost and the liabilities of hotels, are two plausible policies. The latter policy could be connected to climate change measures for the energy efficiency of buildings. Such policies, aiming to promote the financial sustainability of the sector, become more important when specific sectors create increased value within an economy.

Due to the relatively limited number of studies that were identified, there is not much evidence depth to isolate more recurrent results for financial ratios widely used in the broader literature, and this can be considered a limitation of the study.

Future research can provide a more holistic review of the determinants of failure by including besides financial information, additional non-financial information as also external factors. As one benefit of reviews is the aggregation of information on previous studies' design in one place, one can select a specific feature, such as the definition of default or the method of analysis, as a source of differentiation and advancement in the field. A fruitful future direction can also be the use of AI models with large hotel samples representing the whole universe of the economic activity in order to exploit their performance potential and increase the available knowledge ([Guerra-Montenegro et al. 2021](#)). In addition, methods handling more than a single type of failure can be applied. Another direction can be to perform country comparisons, as the results from a single market can be country- or sample-specific and not safely generalizable. Lastly, interesting results could be obtained by investigating further the potential role of ratios related to fixed assets.

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Appendix A

Table A1. Information on study design and financial ratios of the selected studies.

Author(s)	Country	Period	Sample	Definition of Default	Method	Results
Cho (1994)	USA	1982–1993	15 failed and 15 non-failed listed hotels	3 or more consecutive years of negative net income	Logit	Cash flow per share (–)
Adams (1995)	UK	1986–1993	4 listed hotels, of which 3 were suspended	Broad definition, including suspension of trading	MDA	Altman (1968) variables
Gu and Gao (2000)	USA	1987–1996	4 failed and 4 non-failed hotels	Bankruptcy	MDA	Total liabilities/TA, sales/fixed assets, EBIT/current liabilities, gross profit/sales, long-term liabilities/TA

Table A1. Cont.

Author(s)	Country	Period	Sample	Definition of Default	Method	Results
Youn and Gu (2010)	Korea	2000–2005	102 failed and 102 non-failed listed lodging companies	3 consecutive years of negative net income	Logit, NN	EBIT/interest expenses, current assets/current liabilities, quick assets/current liabilities, EBITDA/current liabilities
Kim (2011)	Korea	1995–2002	33 failed and 33 non-failed hotels	Broad definition	MDA, logit, NN, SVM	ROE, current assets/current liabilities, sales/fixed assets, fixed assets/long-term capital, ordinary income/owner's equity, growth in owner's equity, growth in assets
Chen and Yeh (2012)	Taiwan	1995–2008	10 failed and 10 non-failed international tourist hotels	Bankruptcy by Taiwan Tourism Bureau database	Logit	Average operating revenue per employee (–)
Diakomihalis (2012)	Greece	2007–2008	15 failed from 146 hotels, with 4 listed hotels	Bankruptcy	3 MDA models	Altman (1968) variables
H. Li and Sun (2012)	China	1998–2010	7 failed and 16 non-failed listed tourism firms with hotel businesses	2 consecutive years of negative net income	MDA, logit, NN, SVM with nearest neighbor up-sampling technique	Altman (1968) variables
H. Li and Sun (2013)	China	N.A.	154 failed and 159 non-failed listed hotel samples	2 years of negative net income	Case-based reasoning, case-based reasoning ensemble, MDA, logit, SVM	Altman and Hotchkiss (2005) variables
Fernández-Gómez et al. (2016)	Spain	2005–2012	54 failed and 54 non-failed hotels	Bankruptcy	Multi-layer perceptron, probabilistic neural network	EBITDA/current liabilities, net profit margin, liabilities/net worth, total liabilities/TA, sales/accounts receivable
Gémar et al. (2016)	Spain	1997–2009	79 failed hotels from 1033 hotels opened in 1997–2009	Bankruptcy	Cox model	Pre-tax profit/operating revenue (–), employee cost/operating revenues over 43% (+)
Lado-Sestayo et al. (2016)	Spain	2005–2011	106 failed hotels from 6494 hotels	Bankruptcy	Cox, Weibull, Gompertz	Operating net income/TA (–), equity/current liabilities (–), net operating cash flow/TA (–), log TA (–), current assets/TA (+)
Vivel-Búa et al. (2016)	Spain	2008–2011	154 failed hotels from 836 micro, small and medium hotels	Bankruptcy	Logit, probit	Total liabilities/TA (+), current assets/TA (+), operating income/TA (–), equity/current liabilities (–), net turnover/TA (–), TA (–)

Table A1. Cont.

Author(s)	Country	Period	Sample	Definition of Default	Method	Results
Falk and Hagsten (2018)	Sweden	2002–2012	580 failed businesses from 2557 hotels, hostels and cottages	No longer report revenue to the official statistics agency	Cox model	Log revenues/overnight stays (–)
Kim (2018)	USA	1988–2010	26 listed distressed hotels and motels and 132 non-distressed	Financial distress based on the Zmijewski (1984) probit model	Ensemble methods with SVM, NN and decision trees	Debt/equity, stock price trend, sales/accounts receivable
Gemar et al. (2019)	Spain	1997–2016	41 failed hotels from 354 resort hotels	Bankruptcy	Cox model	Employee cost/operating revenues over 43% (+)
Vivel-Búa et al. (2019)	Spain	2007–2015	1747 distressed hotels from 11,558 small and medium-sized hotels	Financial insolvency legal status	Cox, exponential, Weibull, Gompertz	Net income/TA (–), cash flow/TA (–), net sales/TA (–), total liabilities/TA (+), TA (+, less for micro)
Lin and Kim (2020)	Texas, USA	2000–2018	3619 exits from 45,606 hotels	Exit from public hotel tax file	Cox model	Log revenues (–)
Türkcan and Erkuş-Öztürk (2020)	Antalya, Turkey	2000–2016	470 failed hotels from 1487 hotels	Exit from Chamber of Commerce and Industry database	Discrete-time survival model	Size as a dummy variable taking the value of one for medium and large firms based on the initial capital (–)
del Castillo García and Fernández Miguélez (2021)	Spain	2017–2019	69 failed and 69 non-failed hotels	Bankruptcy	Multi-layer perceptron	Net profit/net equity, EBIT/TA, net profit/turnover, EBITDA/current liabilities, cash flow/total liabilities, current assets/current liabilities, turnover/TA, total liabilities/TA
Escribano-Navas and Gemar (2021)	Spain	2005–2018	70 failed hotels from 2615 hotels	Bankruptcy and insolvency	Discrete-time survival model	Ln net sales (–), net income/TA (–), working capital/TA (+)
Maté-Sánchez-Val (2021)	Barcelona, Spain	2015–2018	29 distressed hotels from 235 hotels	2 or 3 years of negative shareholder equity	Logit	Log TA (–), profit before interest and taxes/TA (–)
Pelaez-Verdet and Loscertales-Sanchez (2021)	Spain	2008–2019	2639 lodging enterprises	Bankruptcy	Cox model	Return on capital employed (+, for small-sized hotels)
Piacentino et al. (2021)	Sicily, Italy	2010–2014	166 failed businesses from 660 start-ups in the accommodation sector	Exit from Italian Institute of Statistics database	Cox model	Sales turnover of first year of activity (–)
Correia et al. (2022)	Portugal	2014–2018	57 solvent and 57 insolvent accommodation firms from NACE codes 5520 and 5590	Bankruptcy and insolvency	Probit	Net income/TA (–), sales/TA (–), retained earnings/TA (–), current assets/TA (+)

Table A1. Cont.

Author(s)	Country	Period	Sample	Definition of Default	Method	Results
Caires et al. (2023)	Portugal	2006–2017	N.A.	N.A.	Discrete-time survival model	Log sales (–), operating profit/TA (–), fixed assets/TA (–)
Situm (2023)	Austria	2005–2015	162 observations in the financial distressed group and 304 in the healthy group	Financial distress: negative cash flow and/or negative earnings	Logit	Log TA (–), EBIT/TA (–), Equity/TA (–), dummy variable taking the value of one if total debt > TA (+)
Vivel-Búa and Lado-Sestayo (2023)	Spain	2012–2015	507 failed hotels from 3948 hotels	Financial insolvency	Spatial and nonspatial probit	Log TA (–), income/TA (–)
Zhang and Xie (2023)	Norway	2008–2018	104 failed hotels	Insolvency and liquidation	Cox model	Retained earnings/TA (–), book value of equity/total liabilities (–)

+ / – signs mean a positive/negative relationship with failure. EBIT = earnings before interest and taxes, EBITDA = earnings before interest, taxes, depreciation and amortization, MDA = multivariate discriminant analysis, N.A. = not available, ROE = return on equity, SVM = support vector machine, TA = total assets.

Notes

- ¹ For example, the studies by Li and Sun (2013) and Caires et al. (2023), which are included in the final analysis, were captured only by the second and third algorithm, respectively.
- ² Based on a search conducted on the 12th of June 2023.
- ³ For the interested reader, some further relevant references are provided that did not meet entirely the criteria (Adams 1991; Belda and Cabrer-Borrás 2020; Brouder and Eriksson 2013; Crespí-Cladera et al. 2021; Horváthová and Mokrišová 2018; Ingram and Baum 1997b; Kalnins and Chung 2006; Kaniovski et al. 2008; Kim and Gu 2006; Laguillo et al. 2019; Lee and Thong 2023; Li et al. 2013; Li and Huang 2012; Milašinović et al. 2019; Moncarz and Kron 1993; Pacheco 2015; Pereira et al. 2016, 2017; Santarelli 1998; Tavlin et al. 1989; Wieprow and Gawlik 2021; Zheng et al. 2022).

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