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Predicting bankruptcy in resort hotels: a survival analysis

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Abstract

Purpose – This study aims to examine variables influencing resort hotels' survival in Spain, which had not previously been analysed. In this country, determining whether the reasons resort hotels close are different from other hotels could be imperative to resort hotels' survival.

Design/methodology/approach – The survival analysis used Cox's semi-parametric proportional hazards regression to determine which variables influence hotel closure and how much each variable increases risk of closure.

Findings – Resort hotel closure depends on hotel size, location, executive management and the business cycle. Survival is not affected by hotel type or financial structure.

Research limitations/implications – While this methodology is common in business survival analyses, it has seldom been applied to hotels and has never been used to study the survival of resort hotels.

Practical implications – Companies need to rethink the location of new hotels. For already-built facilities, good management practices are strategically important for resort hotels' survival.

Originality/value – This paper explores the reasons why resort hotels survive. The study's selection of variables and methodology and its conclusions are unique.

Keywords Bankruptcy, Business failure, Survival

Paper type Research paper

1. Introduction

Business survival analysis has rarely been applied to the hospitality industry even though this type of research is important given hotel bankruptcies' negative consequences for society. In addition to costs for stakeholders, business failures generate losses affecting society at large (Branch, 2002) and harming economies by eliminating the benefits firms provide to most stakeholders. These include shareholders, employees, creditors, suppliers, customers and government agencies (Shuai and Li, 2005; Wu, 2010).

Bankruptcy risk is, therefore, of great interest to researchers, producing an extensive literature dedicated to studies assessing the risk of business failure (Bauer and Agarwal, 2014). Bankruptcy prediction models are important as early warning systems for managers so that they can make timely decisions. Financial institutions often apply these models to evaluate more accurately whether companies will be successful. Investors can also use this

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information to improve investment portfolios and make better selections of firms in which to invest. Even employees can apply these models to decide when to stay with or leave a company or evaluate whether to work for another firm (Wu, 2010).

According some researchers, sun and sand are the main motivations for people to visit Spain (Andrades-Caldito *et al.*, 2013), so the mass tourism model has dominated since the international tourism boom first began (Khan, 1997). This has resulted in all types of accommodations built to meet the needs of sun-and-sand tourists (Claver-Cortés *et al.*, 2007). However, changes in tourists' behaviours have invalidated this model (Alegre and Cladera, 2006). Spanish tourism has become highly competitive because of consumers' quickly changing requirements and market globalisation, which is aggravated in the case of mass tourism (Campo-Martínez *et al.*, 2010). Spain has had to change its Fordist-tourism model to improve its competitiveness, address environmental problems and revive old tourism destinations (Almeida Garcia, 2014).

This trend has not meant the end of sun-and-sand tourism, which instead, as Almeida Garcia (2014) asserts, has continued to grow in the post-Fordist phase. Given the special importance of beach resorts in Spain and changes in global tourism, both hotel and destination managers urgently need to understand what influences hotel continuity. However, surprisingly few studies have examined why hotel companies survive (Zhai *et al.*, 2015; Gémar *et al.*, 2016; Lado-Sestayo *et al.*, 2016; Patiar, 2016).

In 2008, Spain's tourism sector began to feel the effects of the international economic crisis intensely, with revenue decreasing for the main tourist destinations. Tourists' number of trips and expenditure plummeted. Many hotels closed in traditional destinations such as Costa del Sol and the Canary and Baleares Islands. This crisis's impacts on hotels have varied for each destination, so research on hotel survival clearly needs to include location-related variables. The present study, therefore, sought to analyse these and other factors in Spanish hotels' survival, focussing specifically on the survival of resorts opened in the last decade.

This research contributes to the literature in three ways. First, the methodology includes an econometric analysis of survival only rarely applied to hotel bankruptcies. Second, this study's originality lies in the variables included. Besides hotel size, location and type, the research model considered variables such as managers' capability, financial structure and launches during crises, as well as duration until bankruptcy. Finally, the research covered a 13-year stretch of hotel openings, as well as 14 years of follow-up for those opened in the first year.

This paper is structured as follows. Section 2 reviews the relevant literature and discusses the hypotheses proposed. Section 3 describes the methodology. The results, discussion and conclusions are presented in Sections 4, 5 and 6.

2. Literature review and hypothesis development

2.1 Theoretical models of bankruptcy

2.1.1 Single-period models. These are the simplest models of bankruptcy, based on companies that last for two accounting periods. The firms' securities are traded in the first period and liquidated in the next period. The companies go bankrupt if their liquidation value is less than the amount they owe creditors (Scott, 1981). However, bankruptcy predictions based on these models have little in common with empirical models because single-period models include only stocks without considering cash flows (Black and Scholes, 1973; Merton, 1974; Schwartz, 1977; Scott, 1981).

2.1.2 Gambler's ruin models. These models assume that changes in companies' capital are random. Positive changes in capital result from cash flows from firms' operations.

Losses require companies to liquidate assets. If the working capital is negative, the firms declare bankruptcy. These models assume companies are cut off from financial markets, so they must finance their losses through the sale of assets. Although gambler's ruin is a simple theory, it helps explain empirical models that rely on accounting values rather than liquidation values (Borch, 1967; Tinsley, 1970; Wilcox, 1971, 1973, 1986; Santomero and Vinso, 1977; Scott, 1981).

2.1.3 Models with perfect access to external capital. To address the previous models' limitations, these models assume that companies have access to external capital, which is why they do not have to sell assets to cope with losses. Firms could thus continue indefinitely, dealing with losses through the sale of debt or equity. Companies remain solvent if their market value is still positive.

However, determining bankruptcy is more difficult since firms' losses are ignored and their optimal value is determined in the absence of losses. If the optimal value is higher than losses, the firms avoid bankruptcy and carry on with their plans. If their optimal value is less than their losses, companies go bankrupt (Scott, 1976, 1981). Empirical models have, therefore, been developed that discriminate successfully between companies that fail and those that remain solvent. Although these models lack an explicit, well-developed theoretical foundation, some are considered valid for predicting company bankruptcy (Scott, 1981).

2.2 Empirical models of business failure and bankruptcy prediction

The first models used to predict business failure were univariate regression models. These techniques can be valid as a first approach, but alone they are insufficient given that various factors explain bankruptcy, thus generating a wide variety of multivariate techniques involving generalisations and comparisons of results. Chen and Yeh (2012) tested the causal relationship between uncertain demand and hotel failure in Taiwan's hotels. The findings include that hotel activity is affected in a direct way by business cycles.

Kim (2011) also developed a method for predicting hotel bankruptcy after examining the characteristic results of multivariate discriminant analysis, logistic regression, artificial neural network and support vector machine models. The cited author suggests that artificial neural networks are a good early warning technique to predict hotel bankruptcy. In addition, Youn and Gu (2010) applied logistic regression techniques and artificial neural network models to financial variables to predict Korean hotel failures.

Many studies have thus focussed on business failure, but their methods only facilitate the identification of relevant factors. Survival techniques or duration models are more appropriate for this type of analysis to not only isolate business failure's determining factors but also estimate how long before bankruptcy occurs. Nonetheless, survival models have been used to analyse hotel closures in only a few studies.

In Sweden's accommodation sector, Kaniovski *et al.* (2008) studied the probability of hotel failure using survival analysis. Factors contributing positively to hotels' survival rate include rapid market growth, a larger initial hotel size and a larger proportion of young companies. In addition, location and high sunk costs with high occupancy rates improve chances of survival. However, Brouder and Eriksson (2013) note that firms founded by entrepreneurs with previous work experience in related sectors are more likely to survive. The cited authors further found no evidence that new companies operating in regions with greater tourist density have a survival advantage and that survivor firms improve their performance over time.

Gémar *et al.* (2016) examined the causes of Spanish hotel company closures using a non-parametric Kaplan-Meier estimator and semi-parametric regression with the Cox proportional hazards model. The findings include that survival depends on hotel size, location, better management and launches in a time of prosperity. Nevertheless, the model's

results show variables of hotel type or financial structure are nonsignificant. Similarly, Lado-Sestayo *et al.* (2016) studied Spanish hotels' survival through survival analysis techniques. The cited authors report that survival depends on location and, in particular, on tourist destinations' occupancy levels.

2.3 Factors affecting hotel survival

Based on the above literature review, the present study sought to develop a model to explain resort hotel survival. The factors analysed were size, location, cost structure, good management practices, financial structure and business cycle.

2.3.1 Size. The factor most often analysed in this type of research has been size. This may be because this variable is easy to measure when quantified via the number of workers, sales volume or total assets, among other easily obtained statistics. A positive relationship between size and survival has been found by many authors (Kaniovski *et al.*, 2008; Mas-Verdú *et al.*, 2015), perhaps because of the lower production costs expected because of economies of scale.

A larger size is also positively associated with greater innovativeness (Jacob and Groizard, 2007; Pikkemaat, 2008). focussing on innovation can help firms adapt better to changes in their economic environment, preparing them for any adverse effects of trends or events (Xie *et al.*, 2011). However, a few studies have not validated size as a survival factor, such as Li and Hamblin's (2003) research on manufacturing companies in the United Kingdom. Size may not be significant if businesses' expansion has been overly accelerated, which, according to Gu and Gao (2000), increases the likelihood of bankruptcy.

Some firms stay small to avoid incurring large losses, but a reduced size means companies struggle to survive. Another similar explanation is that small businesses are less capital intensive, so their variable costs are larger. If these companies experience the shock of falling prices, they are among the first to fail in their market. Smaller-sized companies also go bankrupt because of a lack of liquidity, which can negatively affect their chances of survival (López-García and Puente, 2006). The link between Austrian hotels' size and survival has been examined by Kaniovski *et al.* (2008), who used parametric analysis. Gémar *et al.* (2016) and Lado-Sestayo *et al.* (2016) also considered this relationship for hotels in Spain. Based on the relevant literature, the present study included the following hypothesis:

H1. Hotels' survival depends positively on their size.

2.3.2 Location. Urtasun and Gutiérrez (2017) confirmed that location offers positive economies only for luxury hotels. Li *et al.* (2015) found proof that commercial land use has the most positive influence in terms of upper-grade urban hotels' spatial distribution. Marco-Lajara *et al.* (2016) studied the evolution of sun-and-sand hotels on the Spanish coast confirming that hotels located in destinations with a greater agglomeration of hotels are less profitable. The cited authors suggest instead that hotel location decisions should be based more on natural advantage (e.g. beaches or climate).

Only a few studies have analysed the impact of external variables such as type of destination on firm performance (Sainaghi, 2010a, 2010b). Some researchers, such as Brouder and Eriksson (2013), have reported that new firms operating in tourism regions have a survival advantage. Destinations with valuable resources can also foster high hotel growth rates, which are positively related to chances of survival (Kaniovski *et al.*, 2008), although growth can attract more competitors, making such destinations competitively unsustainable.

Other researchers, such as Becerra *et al.* (2013), have confirmed a moderating effect of locations' level of competition on the price range of hotels in different categories. A hotel's

presence in an urban commercial area can also lead to further development and attract more upper-grade hotels interested in commercial opportunities (Li *et al.*, 2015).

Some authors (Kaniovski *et al.*, 2008; Lado-Sestayo *et al.*, 2016) report that location also significantly affects hotel survival. Professionals in the hotel industry have always argued that location is one of the most important factors in success, so many researchers have sought empirical evidence for this claim (Yang *et al.*, 2014; Gémar *et al.*, 2016). The present study thus incorporated the following hypothesis:

H2. Hotels' survival depends positively on their location.

2.3.3 Cost structure. Hotel type and membership in a hotel chain fundamentally determine each hotel's category and cost structure. However, hotel classification systems tend to have low levels of acceptance in most countries, as categories do not always reflect hotels' real qualities and hotels within the same category can have different characteristics (Ingram, 1996). Various researchers have confirmed that hotel type conditions cost structure, so comparing and evaluating cost structure is easier and potentially more interesting than focussing on official categorisations.

Because hotels operate in competitive environments, cost structure and the weight of indirect costs determine hotels' profitability. In addition, some hotels may go bankrupt because of their inability to refinance short-term debt and/or need to pay off loans with high interest rates or cope with prohibitive charges for fixed costs (Sainaghi *et al.*, 2013). Managers must have quite accurate cost information to make effective decisions (Patiar, 2016), especially since hotels' cost structure has an impact on pricing strategies that define these businesses' competitive position (Dioko *et al.*, 2013).

Some authors have also found evidence of product quality's impact on hotels' efficiency. Delivering superior service quality has become a prerequisite for success and survival in today's highly competitive business environments (Gilbert and Wong, 2003). Arbelo-Pérez *et al.* (2017) note that efficiency estimates and costs must also consider the revenue generated by higher quality products. Hotel managers thus need to implement strategies that increase their services' value to achieve sustainable competitive advantages. To improve service quality, these managers must be able to redirect their limited resources to attributes that are a priority for customers (Albayrak and Caber, 2015). The present study, therefore, postulated a positive link between survival and a better cost structure:

H3. Hotels' survival depends positively on their better cost structure.

After a review of the relevant literature, the present research included three indicators to capture hotels' cost structure: the existence of consolidated accounts, hotel group and hotel category (i.e. 3, 4 or 5 stars).

2.3.4 Good management practices. Hoteliers must be able to analyse their economic environment effectively to survive, adapting to its conditions by improving operational efficiency (Moncarz and Kron, 1993). Indicators of good management practices in hotels can be a low employee cost per operation revenue ratio, a low collection period ratio or a high profit margin (Gémar *et al.*, 2016). Revenue management is a good practice vital to hotels' survival (Cetin *et al.*, 2016).

Along with information technology strategies, competitive human resources also significantly influence hotels' performance (Tavitiyaman *et al.*, 2011). However, this performance needs to be measured in various dimensions because of its complexity (Pnevmatikoudi and Stavrinoudis, 2016). Because good management practices are related to

profitability, the present study postulated a link between good management practices and hotel survival:

H4. Hotels' survival depends positively on their good management practises.

According to Gémar *et al.* (2016), the following three variables can be considered indicators of good management practices: the employee costs to operating revenue ratio, collection period and profit margin.

2.3.5 Financial structure. Traditionally, survival studies have focussed on financial attributes as both profitability and stability ratios are considered to be fundamental factors in companies' survival (Kim, 2011). Various authors have confirmed a causal relationship between companies' debt-capital structure and their general performance. Many scholars who have studied profitability have reported that it forestalls insolvency, which is why previous researchers have justified the use of financial ratios to predict firm failure (Maricica and Georgeta, 2012; Zeytınoglu and Akarım, 2013).

These findings have been applied to the hotel industry in studies of the relationship between hotels' failure and their financial structure (Zhai *et al.*, 2015; Gémar *et al.*, 2016; Lado-Sestayo *et al.*, 2016; Patiar, 2016). A financial structure loaded with short-term debt makes hotels prime candidates for bankruptcy (Gu and Gao, 2000). Thus, the following hypothesis was proposed for the present research:

H5. Hotels' survival depends positively on their better financial structure.

Based on the relevant literature, the following indicators were considered related to hotels' financial structure: gearing ratio, working capital and/or equity, return on assets, return on shareholders' funds and return on capital employed ratio.

2.3.6 Business cycle. Prior studies of company duration have included 'period effects' in analyses of organisational mortality (Boone *et al.*, 2000; Moyano-Fuentes and Núñez-Nickel, 2006). General business cycles broadly represent changes in all industries, although these cycles do not affect all sectors at the same time. Choi *et al.* (1999) conducted a study of the North American hotel industry, showing that cycles of expansion and contraction occur in this industry in specific patterns. Hotel companies seek to anticipate growth periods one to two years in advance, but expansion efforts have been shown to decline abruptly after growth trends reach their peak (Chen and Yeh, 2012).

However, experts disagree regarding whether hotels are more likely to survive if they open in an economic boom or crisis. An accumulation of experience and resources during expansion phases can facilitate business survival, but opening in a recession can make companies more adept at managing risk and finding financing. Given the recent crisis' exceptional severity, its overall effects and the dramatic credit crunch (Smeral, 2009) has led to widespread bankruptcies in all sectors at levels not seen since the Great Depression (Andersen *et al.*, 2012). Based on this review of the literature, the hypothesis below was formulated for the present study:

H6. Hotels opened in an economic boom period are more likely to survive.

To test this hypothesis, data were collected on the year in which the hotels were founded.

3. Materials and methods

The current research sought to specify the time until Spanish resort hotels' failure occurs. Survival analyses can be used to answer this kind of question by modelling time to event data based on two relevant variables: a dependent variable that indicates the time elapsed

until the event of interest and another variable that designates if the event has occurred (Esteve-Pérez *et al.*, 2008; Jenkins, 2008). This approach requires that researchers estimate the time elapsed until a specific event based on other explanatory variables. The above method has been widely used in biomedical research to study the evolution of diseases in groups of patients, including the time that passes until death and the chances of survival for a given period.

Because these models were originally intended to identify survival time, they have generally been used as survival models grouped under the term "duration models" (Cox and Oakes, 1984; Hosmer and Lemeshow, 1999). The variable of time, although quantitative, does not follow a normal distribution, and, at the end, "death" might not occur in some observations. When studies' follow-up phase ends before the terminal event occurs, this is referred to as a "censored observation". Researchers must analyse the data before the phenomenon of interest occurs because they may have to wait many years for it to occur. Given these particularities, this type of analysis was considered appropriate for the present study.

Survival analyses seek to obtain a time-dependent function whose value represents the probability that the terminal event will occur after a time t or the probability that the event will not occur (i.e. survival until the end of time t). The duration variable's probability distribution can be specified by the distribution function, which is defined as the probability that the unknown variable T is less than a given value t, as shown in Formula (1):

$$F(t) = \Pr(T < t) \tag{1}$$

The corresponding density function is $f(t)$, which indicates the probability that the observation will occur in a small interval of time, as expressed by Formula (2):

$$f(t) = \frac{dF(t)}{dt} \tag{2}$$

However, knowing that the probability a given state will have a duration of at least t until the phenomenon of interest occurs is sometimes interesting. The survival function is then defined as Formula (3):

$$S(t) = 1 - F(t) = 1 - \Pr(T \geq t) \tag{3}$$

Nonetheless, the most-used function to characterise the duration variable's probability distribution is known as the hazard function, as shown in Formula (4):

$$\lambda(t) = \frac{f(t)}{S(t)} = \frac{f(t)}{1 - F(t)} \tag{4}$$

in which $\lambda(t)$ is, for each duration interval t, the probability of state change per unit of time within each interval, since the state is maintained until moment t. The hazard function, in probability terms, is stated as Formula (5):

$$\lambda(t) = \lim_{dt \to 0} \frac{\Pr(t \leq T < t + dt \,/\, T \geq t)}{dt} \tag{5}$$

which expresses the instantaneous measure of state change per unit of time. The hazard function conveys, for each duration, the probability of a changing state, conditioned to that duration.

The survival and hazard functions are related as shown in Formula (6):

$$\lambda(t) = \frac{dlnS(t)}{dt} \tag{6}$$

The hazard function enables a characterisation of the duration's temporal dependence, revealing if the rate of company exit due to failure depends on the time the company is active. Different techniques have been used to estimate survival times, including non-parametric techniques (e.g. Kaplan-Meier analysis) or parametric models (e.g. exponential, Weibull and log-logistic). Because parametric models impose a particular path on the hazard function, these models were ruled out as inappropriate for the present study. Cox's semi-parametric proportional hazard model has also been used in similar research, and this technique is particularly appropriate in the current study because Cox's model facilitates a simultaneous analysis of various variables.

3.1 Kaplan-Meier estimator

To perform a non-parametric duration analysis, this research used the Kaplan-Meier estimator (Kaplan and Meier, 1958) to estimate hazard and survival functions. This estimator is widely used because it has extremely few restrictions. The sample hazard rate is computed for each duration t_i, from i to k, in which k is the number of different durations in the sample. After these durations are organised incrementally, the rate is obtained as the proportion of the sample that ends its period of existence in the period $t_i(h_{ti})$ versus the part of the sample that has not ceased to exist before that moment, that is, the proportion that at least reaches the duration $t_i(n_{ti})$. This is expressed in Formula (7):

$$\hat{\lambda}(t_i) = \frac{h_{ti}}{n_{ti}} \tag{7}$$

The rate represents the number of observations that have left the market at the moment t_i divided by the number of observations that could potentially have left the market. Hence, the hazard rate can be interpreted as the conditional probability of leaving the market during each duration. The Kaplan-Meier survival rate for duration t_i defines the estimated probability that a company will remain in the market for at least a time t_i before deciding to leave the market, as shown in Formula (8):

$$\hat{S}(t_i) = \prod_{j=1}^{i} \frac{n_{tj} - h_{tj}}{n_{tj}} = \prod_{j=1}^{i} \left[1 - \hat{\lambda}(t_j)\right] \tag{8}$$

3.2 Cox regression model

The Kaplan–Meier estimator's advantage is its ease of calculation since it can be estimated for each variable, one by one. However, to know various independent variables' effects simultaneously, another type of model, such as the Cox semi-parametric model of proportional hazards or regression (Cox, 1972), is needed. This is presented below as Formula (9):

$$\lambda(t, X) = \lambda_0(t)\exp(X\beta) \tag{9}$$

in which $\lambda_0(t)$ is the baseline hazard function and expresses the dependence of the duration of the data. The second part of the equation, $\exp(X\beta)$, reflects the explanatory variables' effects, for which β is the vector of parameters to be estimated. The model can be estimated

without specifying the baseline hazard function $\lambda_0(t)$. Cox (1972) developed a partial probability estimator that eliminates heterogeneity by considering conditional distributions.

3.3 Database and variables

A sample of 354 resort hotels that opened in Spain between 1997 and 2009 was analysed. A variable was created to represent survival time, which was defined as the time elapsed from the start date of this study's follow-up until the last contact with each company – either because of its failure or to the end of the data collection period on 31 December 2016. In that period, 41 hotels (11.58 per cent) closed. The data were collected from the Iberian Balance Sheet Analysis System, a database for all firms in Spain that collects information from firm registries. All Spanish firms are required by law to submit their accounting records to this system on an annual basis.

The sample only included hotels with an annual operating revenue in excess of €500,000 because the hotels of interest were those with three or more stars. The excluded hotels with lower annual operating revenue were understood to work with a radically different business model. Data were collected on all the variables identified in the literature review. Table I presents a brief description of the variables and descriptive statistics (Tables AI and AII for the correlation matrix and collinearity diagnostics, respectively).

4. Results

Table II presents the results of the non-parametric duration analysis using the Kaplan–Meier estimator to estimate the hazard and survival functions. The log rank, Breslow and Tarone–Ware statistics were calculated to compare the equality of survival distributions for different factor levels. The results suggest that overall survival depends on size, location and business cycle. Of the different variables used to explain size, the results for working capital – validated by all three statistics – and legal form – validated by the log rank statistic – are significant. The relationship between location and survival was validated by the three statistics for the Community of Madrid variable. For the business cycle variable, the periods of expansion are significantly related to survival.

The results shown in Table II also reveal that some factors do not influence resort hotel survival. No variables intended to capture cost structure, good management practices or financial structure significantly explain resort hotels' survival. To confirm different factors' significance, as well as the intensity of their relationship to survival and its sign, a semi-parametric proportional hazards model (i.e. Cox proportional hazards model) was used. Table III presents the results for the Cox semi-parametric model with the coefficients, hazard ratio and level of significance. The hazard ratio indicates each variable's effect on the risk of a change occurring. Positive values for the coefficients indicate that the risk of hotel closure increases.

The survival of resort hotels opened from 1997 to 2009 thus depends on their legal form. More corporation hotels survive because of their operating revenue, so the size category helped to adjust the model better. The variable of working capital was also shown to be a significant variable, but with coefficients close to zero, which cancels out the risk of bankruptcy.

In addition, the results suggest that hotel location, specifically tourist destinations and the Canary Islands, is related to the risk of failure. Hotels in locations focussing on tourism are three times more likely to close. Similar results were obtained for Canary Islands hotels, which are almost five times (i.e. 5.251 times) as likely to fail. However, resort hotels whose headquarters are in the Community of Madrid are more likely to survive.

	N	Min	Max	Mean	SD
Duration (days); survival time	354	570	4742	3149.14	1041.05
Exit (dummy, takes value 1 when the hotel is inactive and 0 elsewhere)	354	0.00	1.00	0.08	0.27
Size					
Operating revenue (euros) (*)	354	507.02	219,517.68	6070.82	14,021.51
Working capital (euros) (*)	354	−2321.42	66,994.00	1185.06	3916.95
Legal form (dummy)	354	0.00	1.00	0.15	0.36
Location					
Tourism location (dummy, Municipality with high concentration of tourist offer)	354	0.00	1.00	0.73	0.45
Distance to airport (km)	354	5.00	214.00	44.87	37.99
Andalusia (dummy)	354	0.00	1.00	0.18	0.39
Cantabria (dummy)	354	0.00	1.00	0.00	0.05
Central Peninsula (dummy)	354	0.00	1.00	0.00	0.05
Catalonia/Valencia (dummy)	354	0.00	1.00	0.24	0.43
Baleares (dummy)	354	0.00	1.00	0.46	0.50
Canary Islands (dummy)	354	0.00	1.00	0.10	0.30
Community of Madrid (dummy)	354	0.00	1.00	0.01	0.11
Cost structure					
Consolidated accounts (dummy)	354	0.00	1.00	0.02	0.13
Hotel group (dummy)	354	0.00	1.00	0.55	0.50
Category (stars)	354	3.00	5.00	3.70	0.58
Management					
Employee cost/Operating revenue (%)	354	0.00	117.82	40.56	14.99
Collection period (days)	354	2.55	1783.92	124.55	183.79
Profit margin (%)	354	−168.24	52.76	−6.59	25.51
Economic/financial structure					
Gearing ratio (%)	338	−824.11	1006.95	132.23	230.43
Working capital/Equity (%)	354	−114.20	1202.52	11.81	93.77
Return on assets (%)	354	−285.08	71.29	−4.05	25.90
Business cycle					
Year in which the hotel was founded	354	1997	2009	2000.75	2.86

Note: *In thousands of euros at 2016 value

Table I.
Variables, brief descriptions and descriptive values

Furthermore, good management practices are important to hotels' survival. A hotel with a ratio of employee costs to operating revenue greater than 43 per cent is almost three times more likely (i.e. 2.664) to close. The business cycle also definitely affects survival rates since hotels that opened after 2003 are three times more likely to survive. In contrast, the variables associated with cost structure and financial structure do not have a significant impact.

5. Discussion

This study produced important findings since, when compared with previous research, the results are consistent with the expected results only in some cases. Regarding variables that indicate size, two types of results were obtained. The initial assumption was that large

Explanatory variable	Log-rank (Mantel–Cox)	Breslow (generalized wilcoxon)	Tarone–Ware
Size			
Operating revenue			
Less than 1 million	0.367	0.082	0.171
Between 1 and 2 million	0.791	1,421	1,198
Between 2 and 4 million	0.018	0.595	0.204
More than 4 million	0.181	0.022	0.060
Working capital (more than 300)	4,623**	2,920*	3,745*
Legal form	2,984**	1,856	2,480
Location			
Tourism location	2,071	2,258	2,418
Distance to an airport			
Less than 25 km	0.002	0.000	0.003
Between 25 and 100 km	0.565	0.618	0.741
More than 100 km	2,275	2,044	2,192
Andalusia	0.000	0.012	0.007
Cantabria Region	0.059	0.058	0.059
Central Peninsula	0.089	0.083	87
Catalonia/Valencia	0.075	0.000	0.012
Baleares	0.049	0.06	0.014
Canary Islands	0.747	0.343	0.461
Community of Madrid	10,278***	7,705***	8,949***
Cost structure			
Consolidated accounts	0.428	0.330	0.386
Hotel group	0.034	0.088	0.062
Category			
Three-star/Four-star/Five-star	1,825	0.790	1,164
Three-star	0.798	0.181	0.371
Management			
Employee cost/operative revenue			
Less than 33%	0.237	0.135	0.215
Between 33 and 43%	0.741	1,361	1,082
More than 43%	1,604	2,072	1,977
Collection period			
Less than 40 days	0.006	0.229	0.081
Between 40 and 90 days	0.053	0.543	0.300
More than 90 days	0.025	0.082	0.079
Profit margin (%)			
Negative	0.398	0.046	0.164
Positive and smaller than 2%	0.755	0.573	0.645
Larger than 2%	1,739	0.642	0.302
Economic/Financial structure			
Gearing ratio (smaller than 80%)	1,664	2,058	2,032
Working capital/equity (smaller than 50%)	0.039	0.212	0.116
Return on assets (positive)	1,579	0.514	0.965
Business cycle			
Hotel launched			
Between 1997 and 1999	1,149	1,063	1,102
Between 2000 and 2002	4,527***	6,113***	5,398***
Between 2003 and 2009	23,896***	28,318***	29,109***

Note: ***, ** and *Statistically significant at the 1%, 5% and 10% levels, respectively

Table II.
Non-parametric tests of equality of survival functions by explanatory variable

Variable	Coefficient	Hazard rate	Sig
Size			
Operating revenue	0.000	1,000	
Working capital	0.001	1,000	*
Legal form (corporation)	−0.822	0.439	*
Location			
Tourism location	1,285	3,614	***
Distance to airport more than 100 kilometres	14,724	2479980.80	
Location: Cantabria Region	14,076	1298047.63	
Location: Central Peninsula	14,282	1594489.37	
Location: Catalonia/Valencia	0.770	2,160	
Location: Balearic Islands	0.340	1,405	
Location: Canary Islands	1,658	5,251	*
Location: Community of Madrid	−1,849	0.157	*
Cost structure			
Consolidated accounts	21,893	3219740160	
Hotel group	0.277	1,319	
Category: four or five-star	0.351	1,421	
Management			
Employee cost/Operating revenue: more than 43%	0.980	2,664	**
Collection period: between 40 and 90 days	0.357	1,430	
Collection period: more than 90 days	−0.103	0.902	
Profit margin	−0.012	0.988	
Economic/Financial structure			
Gearing ratio	0.000	1,000	
Working capital/Equity	−0.008	0.992	
Return on assets	0.003	1,003	
Business cycle			
Year of launch between 2003 and 2009	−2,925	0.054	***
Number of hotels	354		
Number of events	41		

Note: ***, ** and *Statistically significant at the 1, 5 and 10% levels, respectively

Table III.
Cox regression model

hotels outlive smaller hotels (i.e. *H1*). The Kaplan–Meier estimator indicated working capital and legal form are significant variables. These findings were validated by the Cox regression.

However, the variables that traditionally indicate size, such as operating revenue, do not have a significant effect. These results appear to confirm the findings in the literature, which is that economies of scale's advantages are not as clear in the services sector, although a certain size may still be important. This suggests that a minimum efficient size is necessary to establish a hotel, but, once this size is reached, this variable ceases to be important.

H2 postulated a relationship between location and resort hotel survival, which was supported by the results. The Kaplan–Meier estimator indicated that being located in the Community of Madrid influences survival, a finding validated by the Cox regression. The regression also revealed that hotels in tourism destinations and the Canary Islands run a much higher risk of failure. This contrasts with what the literature reports. For example, Gémar *et al.*'s (2016) results indicate that location is important. A distance to an airport

greater than 100 kilometres especially increases the risk of failure. However, this does not happen with resort hotels, for which location remains important not because of their distance to an airport but because of tourism destination and Canary Islands variables. These locations increase the risk of failure for resort hotels established there, indicating that places in Spain classified as tourist destinations show signs of saturation.

Claver-Cortés *et al.* (2007) showed how a mature sun-and-resort destination, such as Benidorm, can continue to be competitive. The present results further indicate that many tourism destinations already have a balance of supply and demand, so entering the hyper-competitive resort hotel market is associated with a high risk of failure. This finding is, however, contradicted by Lado-Sestayo *et al.*'s (2016) results.

H3 said a relationship exists between resort hotels' cost structure and their survival, but this was contradicted by the present results. Variables such as consolidated accounts, hotel group or category are not significant in relation to survival. In contrast, *H4* was accepted. Good management practices decisively influence resort hotels' survival, as expected, yet not all the variables included in this measure are significant. The employee cost to operating revenues ratio is only significant for values over 43 per cent. In addition, the collection period and profit margin variables are nonsignificant. The good management practices of having a low collection ratio or working with an adequate profit margin appear to be only a consequence of other variables. If hotels are not doing well, their managers apparently cannot influence these variables.

H5 postulated a relationship between financial structure and resort hotel survival, which was rejected. No ratios used to measure this aspect were found to determine resort hotels' survival. This result may be explained by hotels having high exit barriers. This means that, although the ratios indicate that the hotels in question should exit the market, this may not be possible because the losses incurred from leaving the market are greater than the losses associated with staying in it.

The present results indicate that the business cycle in which hotels are opened is a fundamental factor, providing support for *H6*. Thus, opening in an economic boom period is important to resort hotels' survival. When a hotel is established in a crisis, the promoters' cautiousness may be so great as to be lethal to the hotels' future. In addition, in crises, bank credit is limited, which prevents hotels from gaining access to all the financial resources needed to succeed into the future.

6. Conclusions

This study analysed the factors influencing the survival of Spanish resort hotels opened from 2003 to 2009. Specific variables were defined and their effects examined, including size, location, cost structure, good management practices, financial structure and business cycle. Both specific company factors and external factors were considered in analyses of firms' survival. The research conducted is the first study on resort hotels' survival in Spain using this selection of variables affecting survival.

The results indicate that size, location, good management practices and business cycle influence resort hotels' lifespan. The factor that most directly increases the risk of market exits is being located in the Canary Islands. In addition, the results confirm that a large size is important because it implies high fixed costs and thus high operating leverage, which is positively related to survival. Entrepreneurs may also need to look for destinations still in high demand since large resort hotels with a low occupancy rate run the risk of bankruptcy.

Entrepreneurs must make the choice between locating hotels where demand exists but with high levels of competition and constructing hotels in other places with less tourist demand and competition. Based on the current results, hotel owners must continue betting

on consolidated tourism destinations, except for the Canary Islands, in which symptoms of maturity have appeared. Given that the present dynamics make betting on other types of destinations difficult, the public sector's role will be fundamental to promoting new destinations that, in the future, will almost certainly attract private hotel investment. Joint commercial decisions with all the relevant agents in these destinations will also be necessary.

These findings have many implications for tourism promoters, including the need to invest in locations other than mature tourist destinations. Identifying emerging destinations is the key to ensuring a higher probability of survival in the future. Once a destination is chosen, location is a variable that cannot be changed. After this, good management practices are the most important, which primarily involve controlling wages in relation to operating revenue. This means keeping the ratio of employee costs to operating revenue down as the level of risk rises if the ratio is greater than 43 per cent.

A professional management team in hotel companies is a key variable. Hotels operate in turbulent environments, so managers must be able to adapt to the continuous changes their firms necessarily experience, focussing especially on staff costs and profit margins. The present results further confirm that resort hotels of the size analysed should separate ownership from management to increase their chances of survival. In addition, the year in which hotels open is important since an economic boom facilitates the necessary financing to make hotel investment successful. The hotel business is capital intensive, so survival is closely linked to economic cycles.

6.1 Theoretical implications

These findings contribute significantly to the existing survival research because they help advance empirical studies of duration and survival analysis applied to businesses. Although this methodology is already standard in medical survival studies and is starting to be used to analyse manufacturing companies' survival, the present model has rarely been applied to hotel bankruptcy. The variables' originality is also an important contribution. In addition to traditional variables such as hotel size, location or type, variables such as managers' ability, financial structure and openings in a time of crisis were also considered, as well as the variable of duration until bankruptcy.

The third contribution is that a long period was analysed, namely, 13 years of hotel openings and closings. Finally, the results highlight a difference in the conditioning factors for bankruptcy of resort hotels versus other hotels that, until this study, had remained hidden in more general samples. Future studies will need to confirm these findings for other destinations.

6.2 Practical implications

This study's results have significant managerial implications. The findings confirm that the type of management applied in hotels is strategically important to avoiding bankruptcy. Good management means being able to design a better future for hotels by organising and developing structures in which everything works as planned and guiding and motivating employees. In addition, competent managers must ensure that everything is performed as expected by analysing deviations from planned results. At this point in time, monitoring the ratio of costs of employees to operating revenue is also extremely important in the quite labour-intensive hotel sector, as this ratio should never reach a value greater than 43 per cent.

The present findings contradict the belief that resort hotel concentrations can improve chances of survival. Locating resort hotels in tourist destinations – and in the Canary

Islands specifically – is related to the risk of failure. These results indicate that hotel entrepreneurs should seek out other destinations to build new hotels given that traditional destinations show clear signs of saturation.

In addition, once an efficient minimum size has been reached, any improvement in survival rates caused by mergers is associated with generating and combining key resources or better brand positioning. Managers should understand not only the advantages but also the limitations of bankruptcy prediction methods. Because of bankruptcy's high private and public costs, it must be avoided. Implementing prediction methods could help hotels start restructuring early enough to prevent bankruptcy. Thus, early warning methods that predict bankruptcy based on the variables studied here need to be kept on hotel managers' scorecards.

6.3 Limitations and future research

This study's primary limitation is that the sample only included Spain's resort hotels. Limiting research to a single country reduces its generalisability, so this analysis needs to be expanded to cover the same cost structure worldwide. The study was also restricted to resort hotels with operating revenues over €500,000 and three to five stars. This research could produce further interesting results with a sample of smaller hotels. Future studies might replicate this research using another form of survival analysis, such as parametric analysis with a Weibull model. Researchers could also compare the present analysis's results with those of studies using logit regression, probit regression, multivariate discriminant analysis, artificial neural networks or structural equations.

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Appendix 1

Table AI.
Pearson's correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Operating revenue	1												
2 Working capital	0.315**	1											
3 Cash flow	0.726**	0.166**	1										
4 Distance to airport	−0.071	−0.013	−0.051	1									
5 Employee costs/Operating revenue	−0.003	−0.020	−0.185**	−0.073	1								
6 Collection period	−0.050	0.136*	−0.121*	−0.095	0.074	1							
7 Profit margin	0.045	−0.040	0.343**	0.054	−0.492**	−0.267**	1						
8 Gearing ratio	0.076	0.081	0.086	0.127*	−0.137*	0.028	0.085	1					
9 Working capital/Equity	−0.029	0.034	−0.034	−0.060	0.079	0.130*	−0.061	−0.072	1				
10 Return on assets	0.007	0.003	0.212**	0.009	−0.413**	−0.028	0.509**	0.143**	−0.029	1			
11 Return on shareholders funds	−0.065	−0.035	−0.062	0.032	−0.047	−0,029	0.098	−0.208**	0.322**	−0.037	1		
12 Return on capital employed ratio	−0.045	−0.006	−0.016	−0.027	0.046	0.029	0.094	−0.160**	0.241**	0.038	0.757**	1	
13 Duration	0.026	−0.070	−0.015	−0.031	−0.050	0.059	−0.044	0.015	−0.016	0.017	0.033	0.014	1

Note: **, *Statistically significant respectively at 1% and 5% level.

Appendix 2

	Collinearity statistics	
	Tolerance	VIF (*)
Size		
Operating revenue	0.615	1,626
Working capital	0.748	1,336
Legal form (corporation)	0.940	1,064
Location		
Tourism location	0.825	1,213
Distance to airport	0.877	1,141
Location: Cantabria Region	0.963	1,038
Location: Central Peninsula	0.957	1,045
Location: Catalonia/Valencia	0.536	1,867
Location: Balearic Islands	0.486	2,057
Location: Canary Islands	0.631	1,585
Location: Community of Madrid	0.800	1,251
Cost structure		
Consolidated accounts	0.562	1,779
Hotel group	0.808	1,238
Category: four or five-star	0.890	1,124
Management		
Employee cost/Operating revenue: more than 43%	0.755	1,325
Collection period: between 40 and 90 days	0.555	1,802
Collection period: more than 90 days	0.504	1,983
Profit margin	0.552	1,813
Economic/Financial structure		
Gearing ratio	0.912	1,097
Working capital/Equity	0.982	1,019
Return on assets	0.652	1,534
Business cycle		
Year of launch between 2003 and 2009	0.971	1,030

Note: (*) VIF: Variance inflation factor

Table AII. Collinearity diagnostics

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