

## Predicting Bankruptcy in Resort Hotels: A Survival Analysis

### Abstract

**Purpose:** This study sought to explore the variables influencing the survival of resort hotels in Spain, which have not previously been studied. In this particular geographical context, determining whether the reasons resort hotels close are different from other types of hotels could be imperative for resort hotels' survival.

**Design/methodology/approach:** The methodology included survival analysis using Cox's semi-parametric proportional hazards regression to determine which variables influence hotel closure and to what degree each variable increases risk of closure.

**Findings:** The results suggest that resort hotel closure depends on hotel size, location, executive management and the business cycle. Survival is not, however, affected by hotel type or financial structure.

**Research implications:** This study makes an important contribution to the empirical literature on survival analysis of hotel businesses. 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:** The findings have practical implications as they suggest that hotel companies need to rethink their location before building 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 is unique in terms of its selection of variables and methodology and its conclusions.

**Keywords:** Survival, bankruptcy, business failure, Cox, Kaplan-Meier

**Article classification:** Research paper

## 1. Introduction

Business survival analysis is commonly used in the manufacturing sector, but this methodology has rarely been applied to the hospitality industry even though this type of research is highly relevant given the negative consequences of hotel bankruptcies for society. In addition to costs for stakeholders, company bankruptcy generates losses affecting all members of society (Branch, 2002). Business failures are thus events that harm economies and society at large. In particular, bankruptcy eliminates the benefits firms provide to most stakeholders, including shareholders, employees, creditors, suppliers, customers and government agencies (Shuai and Li, 2005; Wu, 2010).

Bankruptcy risk is, therefore, of great interest to company shareholders, creditors and employees, which is why an extensive literature has been dedicated to research assessing the risk of companies going bankrupt (Bauer and Agarwal, 2014). Bankruptcy prediction models are important as early warning systems of imminent business failure for managers so that they can make timely decisions. Financial institutions must also often apply these models to reach better decisions when evaluating whether companies will be successful. In addition, investors can use this information to improve their investment portfolios and make better selections of firms in which to invest. Even employees can apply these models to decide when to stay or leave a company or evaluate whether to work for another firm (Wu, 2010).

More research is thus needed on the determinants of hotel companies' survival over a sufficiently long period of time that includes more recent economic crises and analyses of why some hotel companies survive while others fail. The hotel industry has a significant weight in many countries' economies. Thus, hotel companies' importance in the business network and their impact on the economy through generating employment makes the hotel industry a matter of great interest to national leaders.

Moreover, according to the United Nations World Tourism Organisation's (UNWTO) (2017) *World Tourism Barometer*, tourism is one of the fastest growing sectors worldwide. Since this sector is closely related to most countries' development, tourism can be said to be a driver of socioeconomic progress, currently representing 10% of the global gross domestic product (GDP). The expansion of tourism has been beneficial in

economic and employment terms not only for tourism businesses but also for related sectors such as construction or telecommunications.

Spain comes only second to the United States in the size of its tourism sector (UNWTO, 2017), which contributed 11.1% of this country's GDP and 13% of employment in 2015 (Instituto Nacional de Estadística, 2015). According some researchers, sun and sand are the main elements motivating people to visit Spain (Andrades-Caldito *et al.*, 2013).

Since the beginning of the international tourism boom, the mass tourism model has therefore dominated this market (Khan, 1997), resulting in the construction of all types of accommodations to meet the needs of tourists seeking sun and sand (Claver-Cortés *et al.*, 2007).

However, changes in tourists' behaviours have made this model no longer valid (Alegre and Cladera, 2006). The Spanish tourism industry has become highly competitive due to both consumers' quickly changing requirements and market globalisation, which is aggravated in the case of sun and sand-focused mass tourism (Campo-Martínez *et al.*, 2010). Spain has had to change its Fordist-tourism model as the country has sought to improve its competitiveness, resolve environmental problems and revive old tourism destinations (Almeida-Garcia, 2014). Nonetheless, this trend has not meant the end of sun and sand tourism, which, as Almeida-Garcia (2014) asserts, has continued to grow in the post-Fordist phase. Given the importance of tourism – especially sun and sand resorts – in Spain and changes in the global tourism sector, both hotel and destination managers urgently need to understand the factors that influence hotel continuity.

However, surprisingly few previous studies have addressed the causes of hotel companies' survival (Yu and Huimin, 2007; Such Devesa *et al.*, 2009; Xu *et al.*, 2014; Zhai *et al.*, 2015 Gémár *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 quite intensely, with decreases in revenue experienced by the main Spanish tourist destinations. Tourists' number of trips and expenditure plummeted. As a result, many Spanish hotels closed in traditional destinations such as Costa del Sol and the Canary and Balears Islands. The impacts of this crisis on the hotel sector have varied for each tourist destination, so research on hotel survival clearly needs to include variables related to location. The present study, therefore, sought to analyse these and other

determining factors of Spanish hotel companies' survival, focusing more specifically on the survival of hotel resorts opened in the last decade.

This paper contributes to the literature in three ways. First, the methodology includes an econometric analysis of survival. Although this methodology is standard in research on medical survival and this approach has begun to be used to analyse the survival of manufacturing companies, econometric analysis of survival has only rarely been applied to bankruptcy in the hospitality industry. Second, this study's contribution is related to the originality of the variables included. In addition to variables such as hotel size, location and type, the research model considered variables such as managers' capability, financial structure and launches during crises. The variable of duration until bankruptcy was also used. Last, the study 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. In the next section, the relevant literature is reviewed, and hypotheses are discussed. Section three describes the research methodology. The results, discussion and conclusions are presented in the subsequent sections.

## **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, which are based on companies that last for two accounting periods. The firms' securities are traded in the first period and are 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 this model have little in common with empirical findings because, unlike empirical models, 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 the firms' operations. Losses require companies

to liquidate assets. If the working capital is negative, the firms declare bankruptcy. This type of model assumes companies are cut off from financial markets, which is why they 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

In response to the limitation of the previous models, this third kind of model assumes that companies have access to external capital, which is why, when they suffer losses, they no longer necessarily have to sell assets. From this perspective, firms could continue indefinitely and deal with losses through the sale of debt or equity. Companies will remain solvent if their market value is still positive.

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

## 2.2 Empirical models of business failure and bankruptcy prediction

A review of the relevant literature revealed that several statistical techniques have been applied to predict business failure. Various bankruptcy prediction models have been introduced and contrasted empirically in research on bankrupt and solvent companies. The first models used to predict business failure were univariate regression models. For example, Beaver (1966) was interested in predicting failure by using fundamental ratios through comparisons of means, dichotomous classification tests and analyses of likelihood ratios.

As a first approach, univariate techniques can be valid, but they are not sufficient on their own given that several factors explain bankruptcy and thus make other multivariate

techniques that simultaneously use different variables necessary. Thus, the literature includes a wide variety of multivariate techniques that involve generalisations and comparisons of results. Diakomihalis (2012), for instance, used multivariate discriminant analysis to study bankruptcy predictions for different hotel categories in Greece. The cited author reports that five- and three-star hotels have a greater risk of bankruptcy than four-star hotels do, whereas two-star hotels have the lowest risk. Chen and Yeh (2012), in turn, tested the causal relationship between uncertain demand and hotel failure in Taiwan's hotels. The city study's findings included that hotel activity is affected in a direct way by business cycles. Multivariate discriminant analysis has been used by various other researchers (e.g. Li *et al.*, 2013; Li and Sun, 2012).

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 in hotel bankruptcy prediction. The cited author suggests that artificial neural networks are a good early warning technique to predict hotel bankruptcy. In addition, Youn and Gu (2010) employed financial variables to which they applied logistic regression techniques and artificial neural network models to predict business failures for Korean hotels. Park and Hancer (2012) further carried out a comparative analysis using logit and artificial neural network models to forecast bankruptcy in the hospitality industry.

Although a fair number of studies have focused on business failure, their methods only facilitate the identification of factors that affect business failure. Survival techniques or duration models are thus appropriate for this type of analysis since it not only involves knowing the determining factors of business failure but also estimating the length of time before bankruptcy occurs. Nonetheless, survival models have been used to analyse hotel closures in only a few studies.

For example, Baum and Ingram (1998) focused on a sample of hotels in Manhattan and, using duration models, concentrated on how to include organisations' past experiences when predicting hotels' future success. The cited authors report that organisations experience less perceived failure before becoming established – but not after this. In short, Baum and Ingram's (1998) study demonstrated the importance of experience in this context. Kalnins and Chung (2006), in turn, used a Cox survival regression model to analyse a sample of hotels in Texas. The cited authors concluded that the likelihood

of survival of immigrant entrepreneurs' hotels increases when they are surrounded by branded hotels, even when these are not necessarily run by entrepreneurs who are also immigrants.

In Sweden's accommodation sector, Kaniovski *et al.* (2008) studied the probability of hotel failure using survival analysis. Factors contributing positively to the hotel survival rate include rapid market growth, a larger initial hotel size and a generous 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 results confirm 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 not significant. 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 results of 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 due to the variable's ease of measurement as it can be 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 (Dunne and Hughes, 1994; Mata *et al.*, 1995; Segarra and Callejón, 2002; Kaniovski *et al.*, 2008;

Mas-Verdú *et al.*, 2015), which could be explained by the lower production costs expected due to economies of scale associated with a larger size (de la Peña *et al.*, 2016).

A larger size is also positively associated with greater innovativeness (e.g. Jacob and Groizard, 2007; Pikkemaat, 2008). A focus on innovation can allow firms to be more aware of and adapt better to changes in their economic environment, preparing them for any adverse effects of trends or events (Xie *et al.*, 2011). However, some studies, although fewer in number, 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. According to Gu and Gao (2000), fast expansion increases the likelihood of hospitality firms going bankrupt.

Some firms stay small to avoid incurring large losses, but these companies' size makes it difficult for them to survive. Another similar explanation is that small businesses are less capital intensive, which means that their variable costs are larger. If these companies experience the shock of falling prices, these small firms will be among the first to fail in their market. A further explanation of bankruptcy related to the smaller size of some companies is their lack of liquidity, which could have a negative impact on these firms' chances of survival (López-García and Puente, 2006). Hotel companies have previously been examined regarding the relationship between size and survival by Kaniovski *et al.* (2008), who used parametric analysis to study a sample of hotels in Austria. In addition, Gémár *et al.* (2016) and Lado-Sestayo *et al.* (2016) considered this relationship for hotels in Spain. Based on the present review of the relevant literature, the following hypothesis was developed for this study:

*Hypothesis 1: Hotels' survival depends positively on their size.*

### 2.3.2 Location

The grouping patterns of urban hotels and their effects on performance have been studied by, for example, Urtasun and Gutiérrez (2017), who confirmed that location offers positive economies only for luxury hotels. Li *et al.* (2015), in turn, found proof that, for urban hotels, the most positive influence of the spatial distribution of upper-grade hotels was commercial land use. The evolution of sun and sand hotels located on



the Spanish coast was studied by Marco-Lajara *et al.* (2016), who confirmed 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) than on agglomeration economies (i.e. the advantages of locations in destinations with more hotels).

Until now, 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 regions specialised in tourism have a survival advantage. Destinations with valuable resources can also foster high hotel growth rates, which are positively related to chances of survival (Kaniowski *et al.*, 2008). However, this growth can attract increasing numbers of competitors, making such destinations competitively unsustainable.

Other researchers such as Becerra *et al.* (2013) have found evidence of a moderating effect of locations' level of competition on the price range of hotels in different categories. Similarly, Falk (2013) confirmed that levels of competition had a fundamental role in the survival of ski lift companies. For urban hotels, the presence of a hotel in a commercial area can lead to further development and attract more upper-grade hotels interested in commercial opportunities (Li *et al.*, 2015).

Some authors, such as Kaniowski *et al.* (2008) and Lado-Sestayo *et al.* (2016), report that location also significantly affects the probability of hotel survival. Professionals in the hotel industry have always argued that location is one of the most important factors in success, which is why many researchers have sought empirical evidence for this claim (Adam and Amuquandoh, 2013; Yang *et al.*, 2014; Assaf *et al.*, 2015; G emar *et al.*, 2016). The following hypothesis was thus proposed for the present study:

*Hypothesis 2: 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 its cost structure. However, hotel classification systems tend to have low levels of acceptance in most countries, as categories do not always reflect the real qualities of hotels and hotels within the same category can have different characteristics

(Ingram, 1996). The cited author, nonetheless, argues that the development of classification and categorisation systems for hotels and other accommodations in the United Kingdom has important effects on both clients and professionals. Given the evidence found for low acceptance levels of the Crown classification system of the United Kingdom's national tourist board, Ingram (1996) examined major problems in developing effective hotel rating systems. The cited author focused on the perspective of managers of both lodging and breakfast operations.

Other researchers have confirmed that hotel type conditions cost structure, so comparing and evaluating this structure is easier and potentially more interesting than examining the heterogeneity of hotels' official categorisation. 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, as well as their 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 the cost structure of hotels has an impact on pricing strategies that define these businesses' competitive position (Dioko *et al.*, 2013).

Various authors have also provided empirical evidence of the impact of product quality on hotels' efficiency. Delivering superior quality of service has become a prerequisite for success and survival in the current, highly competitive business environment (Gilbert and Wong, 2003). Arbelo-Pérez *et al.* (2017) note that efficiency estimates, as well as costs, must also consider the revenue generated by higher quality products. Hotel managers thus need to implement strategies that increase the value of their services to achieve sustainable competitive advantages. To improve the quality of services, these managers must be able to recognise and 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:

*Hypothesis 3: Hotels' survival depends positively on their better cost structure.*

Based on the literature review, the present research has considered these three indicators in order to capture the cost structure: the existence of consolidated accounts, Hotel group and Category (3, 4 or 5 stars).

### 2.3.4 Good Management Practices

Hoteliers must be able to analyse their economic environment effectively in order to survive, adapting to its conditions by looking for ways to improve operational efficiency (Moncarz and Kron, 1993). Strategic management has become a key factor in tourism development due to high working capital needs and long timeframes (Sainaghi *et al.*, 2017). 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 management practice and is vital to hotels' survival (Cetin *et al.*, 2016). With information technology strategies, competitive human resources significantly influence hotels' performance (Tavitiyaman *et al.*, 2011). However, this performance needs to be measured in various dimensions since it can be a quite complex concept (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:

*Hypothesis 4: Hotels' survival depends positively on their good management practises.*

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

### 2.3.5 Financial structure

Traditionally, survival studies have focused on financial attributes (Pereira *et al.*, 2016) because the literature considers both profitability and stability ratios to be fundamental factors in companies' survival or bankruptcy (Kim, 2011). Various authors have found support for a causal relationship between companies' debt-capital structure and their general performance. For example, Madan (2007) confirmed this link for a sample of hotels in India. Many other authors 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 (Houghton and Woodliff, 1987; Rushinek and

Rushinek, 1987; Lin *et al.*, 2011; Maricica and Georgeta, 2012; Zeytinoglu and Akarım, 2013; Xu *et al.*, 2014).

Zavgren (1985), for instance, found proof of the importance of turnover and liquidity ratios in firms' survival in the long term and short term, respectively. Along the same lines, Kim and Gu (2006) confirmed that a prudent sales growth strategy, a tighter control of operating expenses and less debt financing significantly reduce bankruptcy risks. In restaurants, Gu (2002) found that bankruptcy probabilities were especially closely linked to low earnings before interest and taxes, low sales levels and an unbalanced debt structure.

These findings have been applied to the hotel industry in studies of the relationship between hotels' failure and their financial structure (Yu and Huimin, 2007; Such Devesa *et al.*, 2009; Xu *et al.*, 2014; Zhai *et al.*, 2015 Gémar *et al.*, 2016; Lado-Sestayo *et al.*, 2016; Patiar, 2016). A financial structure loaded with short-term debt makes hospitality firms prime candidates for bankruptcy (Gu and Gao, 2000). Thus, the following hypothesis was proposed for the present research:

*Hypothesis 5: Hotels' survival depends positively on their better financial structure.*

According to the literature review, the following indicators were considered in relation to the financial structure: gearing ratio, working capital/equity, return on assets, return shareholders funds and return on capital employed ratio.

### 2.3.6 Business cycle

Some prior studies of duration of companies 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 this does not mean that these cycles affect all industries 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 the hotel industry in specific patterns. The hotel industry seeks 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).

Skokic *et al.* (2016), in turn, examined the factors that stimulate entrepreneurship in hotels during periods of economic and social turbulence. Perles-Ribes *et al.* (2016) analysed the economic effects of crises on tourist destinations in Spain. In times of crisis, the local population is more supportive of tourism development without considering possible negative external factors (Garau-Vadell *et al.*, 2016). As a result, policymakers seek to promote this sector and relax legislation to facilitate the implementation of development projects.

However, experts disagree regarding whether hotels are more likely to survive if they open in an economic boom or crisis period. An accumulation of experience and resources during expansion phases can facilitate business survival, but opening in a recession can make companies more adept at risk management and searches for financing. Given the exceptional severity of the most recent crisis, its overall effects and the dramatic credit crisis (Smeral, 2009) has led to widespread bankruptcy of companies 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:

*Hypothesis 6: Hotels opened in an economic boom period are more likely to survive.*

For this purpose, the year in which the hotel was founded was collected.

### **3. Materials and Methods**

Knowing the expected length of time until one or more events happen can sometimes be of great interest. This research sought to specify the time until Spanish resort hotels' failure occurs. In statistical terms, survival analyses can be used to answer this kind of question by modelling time to event data. This type of analysis includes two variables of interest: 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).

The above approach to survival analysis requires that researchers estimate the time elapsed until a specific event based on other explanatory variables. This type of analysis 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 been generally used as survival models, which have been grouped under the term ‘duration models’ (Kalbfleisch and Prentice, 1980; Allison, 1984; Cox and Oakes, 1984; Hosmer and Lemeshow, 1999).

The variable of time, although quantitative, does not follow a normal distribution, and, at the end of this type of study, ‘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 (i.e. survival models) was considered appropriate in the present research.

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 probability distribution of the duration variable 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):

$$F(t) = \Pr(T < t) \quad (1)$$

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):

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

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

$$S(t) = 1 - F(t) = 1 - \Pr(T \geq t) \quad (3)$$

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

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

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):

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

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):

$$\lambda(t) = \frac{d \ln S(t)}{dt} \quad (6)$$

The hazard function enables a characterisation of the temporal dependence of the duration, which reveals if the rate of company exit due to failure depends on the time that 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 (Kalbfleisch and Prentice, 1980), these models were ruled out as inappropriate for the present study. Cox's semi-parametric proportional hazard model has also been used in this kind of research, and this technique is particularly appropriate in the current study because Cox's model facilitates the simultaneous analysis of several variables.

### 3.1 Kaplan-Meier estimator

To perform a non-parametric duration analysis, the Kaplan-Meier estimator (Kaplan and Meier, 1958) was used in the present study to estimate the 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  $t_i(h_{t_i})$  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):

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

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):

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

### 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 the effects of several independent variables 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):

$$\lambda(t, X) = \lambda_0(t) \exp(X\beta) \quad (9)$$

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 effects of explanatory variables, for which  $\beta$  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 due to its failure or to the end of the data collection period on 31 December 2016. In that period, 41 hotels (11.58%) 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, as described in the previous discussion of the hypotheses proposed. Table 1 presents a brief description of the variables and descriptive statistics (see Appendix 1 for the correlation matrix and Appendix 2 for the collinearity diagnostics).

*Insert Table 1 here.*

#### **4. Results**

Table 2 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, financial structure 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. The link between survival and the variables of financial structure and liquidity between 0.5 and 1.0 was validated by the Breslow and Tarone-Ware statistics. For the business cycle variable, the periods of expansion are significantly related to survival.

*Insert Table 2 here.*

The results shown in Table 2 also reveal that some factors do not influence resort hotel survival. None of the variables intended to capture the cost structure or good management practices are significant in explaining the survival of resort hotels. To confirm the significance of different factors, 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 3 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.

*Insert Table 3 here.*

The survival of resort hotels opened from 1997 to 2009 thus depends on legal form. More corporation hotels survive Operating revenue, within the size category helped to adjust the model better. The variable Working capital is shown as a significant variable, but with coefficients close to zero, which cancels out the risk of bankruptcy.

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

Furthermore, good management practices are important to hotels' survival. The probability of closure for a hotel with a ratio of employee costs to operating revenue greater than 43% is almost three times more likely (i.e. 2.664) than for other hotels. The business cycle also definitely affects survival rates since hotels that opened after 2003 are three times more likely to survive than other resort hotels are. However, 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 expectations only in some cases. The present study sought

to identify the factors that strongly influence the survival of Spanish resort hotels opened between 1997 and 2009. A series of variables were thus included in analyses to represent each of the possible factors: size, location, cost structure, good management practices, financial structure and business cycle.

Regarding whether the effects of variables that indicate size are related to survival, two types of results were obtained. The initial assumption was that large hotels outlive smaller hotels (i.e. Hypothesis 1). The Kaplan-Meier estimator indicated working capital and legal form are significant variables. These findings were validated by the Cox regression. However, although variables that traditionally indicate size, such as operating revenue, total assets and equity, had significant effect, the causal relationships were nullified because the model attributed a null value to the coefficients. These results appear to confirm the findings in the literature, which is that the advantages of economies of scale are not as clear in the services sector, although a certain size is still apparently 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.

Hypothesis 2 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. Although the Cox regression validated this variable's significance, it also pointed out that hotels in tourism destinations and the Canary Islands are running a much higher risk of failure than other resort hotels do. This contrasts with what has been reported in the literature. For example, G emar *et al.*'s (2016) results indicate that location is important – especially a distance to an airport greater than 100 kilometres, which 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 the tourism destination and Canary Islands variables. These locations increase the risk of failure for resort hotels established there, which indicates that places in Spain classified as tourist destinations show signs of saturation.

Therefore, renovation strategies need to be implemented in these mature destinations. These strategies can include those suggested by Medina-Mu oz *et al.* (2016) in their study of the Canary Islands. Claver-Cort es *et al.* (2007) also showed how a mature sun and resort destination, such as Benidorm, can continue to be competitive. The present

results further indicate that a balance of supply and demand already exists in many tourism destinations, so entering the hyper-competitive resort hotel market is associated with a high risk of failure. This finding, however, is contradicted by Lado-Sestayo *et al.*'s (2016) results.

Hypothesis 3 said a relationship exists between cost structure of resort hotels and their survival, but this was rejected in the present results. Variables such as consolidated accounts, hotel group or category are not significant in relation to survival. In contrast, Hypothesis 4 was accepted. Good management practices decisively influence the survival of resort hotels, as expected. However, not all the variables included in this measurement are significant. The employee cost to operating revenues ratio is only significant for values over 43%. In addition, the collection period and profit margin variables are not significant. It seems that the good management practices of having a good collection ratio or working with a adequate profit margin are only a consequence of other variables. If the hotel is not doing well, it does not seem that the manager can influence these variables.

Hypothesis 5 postulated a relationship between financial structure and resort hotel survival, which was rejected. None of the ratios studied to measure this aspect were found relevant to determining 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 Hypothesis 6. Thus, opening in an economic boom period is important to survival in the resort hotel market. When a hotel is established in a time of crisis, the promoters' cautiousness may be so great that this can be lethal to the hotels' future. In addition, in times of crisis, a limit is put on bank credit, 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, such as

size, location, cost structure, good management practices, financial structure and business cycle. Both specific company factors and external factors were taken into account in analyses of firms' survival. The research conducted is original as it is the first study on the survival of resort hotels in Spain using this selection of variables that affect survival.

The results indicate that size, location, good management practices and business cycle influence the lifespan of resort hotels. The factor that most directly increases the risk of market exits is being located in the Canary Islands. Regarding hotel size, the results confirm that a large size is important since this is positively related to survival. A large size implies high fixed costs and thus high operating leverage. Entrepreneurs could also need to look for places still in high demand since large resort hotels cannot afford a low occupancy rate that could cause them to go bankrupt.

The findings show that the Canary Islands are a mature destination and that it presents important risks for tourism promoters who decide to invest there rather than in other Spanish resort destinations. The results also indicate few benefits can be gained from investing in destinations known primarily for tourism. Given that location is such an important factor, entrepreneurs must carefully consider the initial selection of their hotels' location as this is a strategic variable that will condition their future profits. These findings may help hotel companies to find optimal locations that guarantee their survival.

Every entrepreneur must make the decision between locating hotels where demand exists but with high levels of competition or locating hotels in other places with less tourist demand and competition. Based on the current result, hotel owners must continue betting on consolidated tourism destinations. The exception is the Canary Islands in which symptoms of maturity have appeared. Given that the current dynamics make betting on other types of destinations difficult, the role of the public sector 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 high probability of survival in the future. Once a destination is chosen, location is a variable that cannot be changed. After this, the most important factor is good management practices, which this study's results show are based primarily on controlling wages in relation to operating revenue. This means keeping the ratio of employee costs to operating revenue under control, as the level of risk rises if the ratio is greater than 43%.

A professional management team in hotel companies is a key variable. Hotel businesses operate in turbulent environments, so hotel managers must have the ability to adapt to the continuous changes their firms necessarily experience. Hotel managers should especially focus on staff costs and profit margins. The present results further support the conclusion that resort hotels of the size analysed should opt for a separation between ownership and 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 this type of investment successful. The hotel business is capital intensive, so survival is closely linked to economic cycles.

### *6.1 Contributions to body of knowledge*

This study makes an important contribution to the existing body of knowledge in survival research because the results help advance empirical studies of duration and survival analysis applied to businesses. Although this methodology is already standard in the literature on medical survival and this approach has begun to be used to analyse the survival of manufacturing companies, the present model has rarely been applied to bankruptcy in the hospitality industry. A second contribution is related to the originality of the variables. In addition to traditional variables such as hotel size, location or type, variables such as managers' ability, financial structure and launch in a time of crisis were also considered. The variable of duration until bankruptcy was also included.

The third contribution is that a long period of time was analysed, namely, 13 years of hotel openings and closings. Last, 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 Managerial implications*

This study's results have significant managerial implications. The findings support the conclusion that the type of management applied in hotels is strategically important to ensuring that they do not go bankrupt. Good management means being able to design a better future for hotels, organising and building structures so that everything works as planned to guide and motivate 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. Managers need to make sure this ratio never reaches a value greater than 43%.

The present findings contradict the belief that concentrations of resort hotels can improve chances of survival. The location of resort hotels in tourist destinations and in the Canary Islands specifically, is related to the risk of failure. Being consistent with these findings, hotel entrepreneurs should seek other destinations to build new hotels given that traditional destinations give clear signs of saturation. Before the hotel is run it must be built. The location will determine from the beginning the future success or not of the hotel manager's management. If the hotel manager can influence the choice of destination, it is consistent that he should recommend an unsaturated tourist destination.

In terms of size, once an efficient minimum size has been reached, any improvement in survival rates caused by mergers is associated with the generation and combination of key resources or better brand positioning.

Managers should know the advantages and limitations of bankruptcy prediction methods. Bankruptcy generates high private and public costs, which is very important to avoid. The implementation of bankruptcy prediction methods could help the restructuring in advance to avoid bankruptcy. The implementation of early warning methods to predict bankruptcy, taking into account the variables studied here, should be in the scorecard of a hotel manager.

### *6.3 Limitations and future avenues of research*

The primary limitation of this study is that the sample only included resort hotels in Spain. Limiting the research to a single country reduces its generalisability. Thus, this analysis needs to be expanded to cover the same cost structure worldwide. The study was also limited to resort hotels with operating revenues over €500,000 and to three- to

five-star hotels. This type of research could produce further interesting results if it is conducted with a sample of smaller hotels. Another future line of research might be to replicate this study using another form of survival analysis, such as parametric analysis using a Weibull model. Researchers could also compare the present analyses' results with those of studies using logit regression, probit regression, multivariate discriminant analysis, artificial neural networks or structural equations.

## Appendix

*Insert here Appendix 1*

*Insert here Appendix 2*

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