

1 **Survival analysis of the Spanish hotel industry**

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18
19 **ABSTRACT**

20
21 The main objective of this study is an analysis of survival in the Spanish hotel industry. We used
22 a sample of 1,033 hotels opened from 1997 to 2009, examining financial and non-financial
23 variables, including size; location; type of hotel; management, economic and financial structure
24 and the year they opened, whether during an expansion or crisis period. The methodology
25 included an econometric analysis of survival, using the non-parametric Kaplan-Meier estimator
26 of constructed variables, in order to detect the particular influence of each variable. Semi-
27 parametric regression was done with the Cox proportional hazards model, confirming which
28 variables clearly influenced the survival of hotels and which signs existed for each analysed
29 variables' influence. The survival of hotels depends on their size, location, management and
30 launch in a time of prosperity. However, survival rates were not significantly tied to particular
31 types of hotels or configurations of their economic and financial structures.

32
33 **KEYWORDS**

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35 Survival analysis, Cox model, Kaplan-Meier estimator, hotel industry, duration models, ceasing
36 to operate, business failure, bankruptcy

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38 1. INTRODUCTION

39

40 Over the decades, according to the UNWTO's (2012) World Tourism Barometer, tourism has
41 experienced continued growth and deepening diversification to become one of the fastest
42 growing economic sectors in the world. These dynamics have turned tourism into a key driver
43 for socioeconomic progress all over the world. This is particularly true in Spain, one of the
44 leading countries in tourism worldwide, where the participation of tourism in the gross
45 domestic product and the percentage of total employment fluctuates around 12% (Instituto
46 Estudios Turisticos, 2013).

47 Given the relevance of tourism to industrialised and developing economies and, in particular,
48 the hospitality sector (Hemmington, 2007), it is important to understand the incentives tourism
49 offers that attract private investors and the factors that determine post-entry performance.
50 Clearly, investment in hotel industries is important for stimulating economies (Pan, 2005).

51 In this study, we put together a unique sample of more than 1,000 hotels to understand the
52 post-entry performance of the hotel industry in the Spanish economy from 1997 to 2009. In
53 particular, we applied the Cox regression model, together with Kaplan-Meier estimates, to
54 identify which factors most influence the probability of survival of hotels in Spain.

55 A novel aspect of this study is that it incorporates financial and non-financial information for
56 companies. Regarding financial information, over 13 years of data were provided by the Iberian
57 Balance Sheet Analysis System (SABI) database, which summarises and organises financial
58 information from official records. SABI contains comprehensive financial information and
59 business intelligence for companies in Spain and Portugal. The SABI data have been enriched
60 with other variables that incorporate specific features of hotel companies. These variables refer
61 to dimensions that the literature and conventional wisdom associate with hotel survival. In this
62 way, we obtained information on size, age, location, quality and hotel typology. The economic
63 and financial structure of hotels was also considered, together with the hotels' management
64 structure and launching period, to assess whether these variables strongly influence survival.

65 A second novelty in this study is that, although the methodology we used is quite standard in
66 the literature on survival, this approach has usually been used in the manufacturing sector, and
67 it has quite rarely been applied to the hospitality industry. To the best of our knowledge, the
68 exceptions are Baum and Ingram (1998), who examined the failure of hotels in Manhattan, and
69 Kaniowski, Peneder and Smeral (2008), who used parametric duration analysis to determine the
70 survival rate of firms in the Austrian accommodation sector. Other than these two studies, the
71 few studies that applied models of duration to the hospitality sector have estimated the length
72 of tourists' stay.

73 Our results give an interesting picture of survival in the Spanish hotel industry, suggesting
74 strategies that investors and policymakers can adopt in order to improve the duration of the
75 accommodation sector. According to our analysis, the most significant features of successful
76 hotels in terms of duration are being launched in times of prosperity with a clear distinction
77 between ownership and management, proper accessibility to the destination and good
78 management practices. Among the features that do not make any difference on the probability
79 of survival are the typology of the hotels and their financial and economic structure.

80 The rest of the paper is organised as follows. Section two reviews the relevant literature, while
81 section three is devoted to the research design. Section four presents the research methodology,
82 and results are presented in section five and discussed in section six. Finally, section seven
83 offers conclusions.

84

85 **2. LITERATURE REVIEW**

86

87 Business demography studies phenomena related to the entry, survival and exit of firms in
88 markets. This field started with Marshall (1920) and Schumpeter's (1934) work and then
89 moved into researching industrial organisations with authors such as Gibrat (1931) and Bain
90 (1956).

91 The initial emphasis in the literature was on the entry of new firms in markets. Relevant
92 empirical work has been done on business dynamics by many authors, including Evans (1987);
93 Hall (1987); Dunne, Roberts and Samuelson (1988); Audretsch (1991); Geroski (1995) and
94 Caves (1998). These authors noted that the entry of new firms in markets is regularly
95 associated with turbulence. The main conclusions of these studies reveal that, in business
96 demography, (1) size is relevant in industries, (2) small businesses show considerable turnover
97 and (3) the entry of new companies operates as a selection mechanism to introduce innovations
98 in the early stages of the life cycle of industries and/or markets.

99 On a theoretical level, the contribution of Nelson and Winter (1982) needs to be highlighted,
100 linking entrepreneurship with the concept of technological regime. Their work also inspired
101 models by Klepper (1996) and Klepper and Simons (2000), who studied the relationship
102 between input and output and product life cycle, as well as models by Jovanovic (1982) and
103 others who observed the heterogeneity of firms entering markets and examined the concepts of
104 selection and learning. According to Jovanovic (1982), new companies have no idea what will
105 happen with their performance after entry, so the probability of survival is assumed to be
106 randomly distributed among companies.

107 This led Audetsch and Mata (1995) to put a greater emphasis on understanding the post-entry
108 performance of firms:

109 A series of studies focusing on the process entry has led to the conclusion that
110 what happens to firms subsequent to their entry is at least as important as the
111 entry process itself. Understanding the *post-entry performance* of firms is
112 important because it sheds light on the *selection process of markets*, enabling
113 some firms to survive and grow while others stagnate and finally exit. (p. ,
114 emphasis in the original)

115 While studies in recent years have shown a growing interest in research on the market entry of
116 new firms, the understanding of post-entry performance is still poor. The entry and exit of firms
117 tends to occur simultaneously. That outputs correlate with inputs is an observation that enjoys
118 consensus in the literature on enterprise mobility, as emphasised by Evans and Siegfried
119 (1992), Love (1996), Fotopoulos and Spence (1998) and Disney, Haskel and Heden (1999).
120 Segarra (2002) and Segarra et al. (2002) further explained the divergent paths and intensity of
121 inflow and exit of firms based on their heterogeneous nature.

122 Although relationships between business survival and growth, age and size have proved
123 consistent in findings on manufacturing firms, based on concrete results (Dunnes & Hughes,
124 1994; Dunne, Roberts & Samuelson, 1989; Geroski, 1995; Sutton, 1997), no such evidence exists
125 for service firms (Mansfield, 1962). Post-entry performance seems remarkably different in the
126 service industry when compared to manufacturing. Among the few studies of service firms,
127 Audretsch, Klomp and Thurik (1997) used a longitudinal database for Dutch companies in the
128 retail and hospitality industries to identify around 13,000 new firms and 47,000 established
129 firms. The cited authors developed a process to keep track of these over a number of years. The
130 results suggested that the relationships between firm size, age, survival and growth are
131 markedly different for service than for manufacturing companies. Similar results were obtained
132 by Segarra and Teruel (2007).

133 The positive impact of age on the probability of survival in both service and manufacturing
134 suggests that new firms have a high propensity to disappear in the period immediately after
135 entry (Jovanovic, 1982). However, studies have found differences and similarities between the
136 motivators of business survival in the manufacturing and service sectors. What is different in
137 service as compared to manufacturing is the apparent lack of economies of scale, so the role
138 played by size shrinks rapidly and disappears upon reaching a minimum size. In addition, the
139 average start-up in the manufacturing sector is considerably larger than start-up service firms
140 are.

141 In the literature on the hospitality industry, there are few papers dealing with the survival of
142 firms. Baum and Ingram (1998) examined how the experience level of the organisation, the
143 population and the related business group affect the failure of hotels in Manhattan. The results
144 indicate the difficulty of applying different types of experience when attempting to reduce the
145 risk of organisational failure, as well as the relevance of experience in the evolution of
146 organisational populations.

147 Kaniovski, Peneder and Smeral (2008) used parametric duration analysis to determine the
148 survival rate of firms in the Austrian accommodation sector. Factors that contribute positively
149 to the survival rate of entrants in the accommodation sector include larger initial size, a large
150 share of young firms and fast market growth. High sunk costs and the location of businesses in
151 major tourist destinations with a distinctive winter and summer season and a relatively high
152 average bed utilisation rate further improve the odds of survival. The hazard rate is lower than
153 in the production of other market services, but higher than in manufacturing.

154 Analyses of duration or survival of hotels have been used when examining the duration of stay
155 in hotels. In the literature, this analysis of duration of stay has also been carried out using
156 approaches other than survival models. Alegre and Pou (2006) examined the microeconomic
157 determinants of the length of stay in single destination tourism. However, the logit model
158 employed was discrete and not an estimated survival analysis. Survival models in tourism have
159 been used to analyse length of stay by Gokovali, Bahar and Kozak (2007); Barros, Correia and
160 Crouch (2008); Martínez-García and Raya (2008); Barros, Butler and Correia (2010); Barros
161 and Machado (2010); Peypoch, Randriamboarison, Rasoamananjara and Solonandrasana
162 (2012); Thrane (2012) and Wang, Little and DelHomme-Little (2012).

163

164 **3. RESEARCH DESIGN**

165

166 Our variable of interest is the duration of a hotel, defined as the time elapsed between the entry
167 and the exit of the hotel, that is, the period between the foundation of the company (entry) to
168 the end of its activities (exit). For some hotels, this period can be fully observed (i.e. when the
169 hotel ceases to operate during the time interval) or can be subject to right censoring (i.e. when
170 the exit does not take place). In this section, we first put forward a number of hypotheses based
171 on the variables that the literature suggests might affect the duration of hotels, and then we
172 introduce our analytical procedure, with a description of the variables used in the study.

173

174 **3.1 Hypotheses**

175

176 According to the literature on firm duration outlined in the previous section, a number of
177 factors are relevant to the survival of companies. These can be classified into internal factors
178 (i.e. firm-specific factors) and external factors. For our study, we selected size, management and

179 the economic and financial structure of the hotel as internal factors and location, typology of
180 hotel and business cycle for the external factors.

181 The positive relationship between survival rate and size is a stylised fact in the literature
182 (Geroski, 1995), and this relationship has been validated in a number of empirical studies: Acs
183 and Audretsch (1989); Wagner (1994); Mata, Portugal and Guimaraes (1995); Audretsch,
184 Santarelli and Vivarelli (1999); Segarra and Callejón (2002) and Nurmi (2006). Although there
185 is no conclusive evidence that service firms also enjoy the benefits of economies of scale, we,
186 nonetheless, postulated a positive link between hotel size and hotel duration as a working
187 hypothesis.

188 Hypothesis 1: *The probability of survival depends positively on hotel size.*

189 As we were interested in testing the effect of size, we worked with up to 10 different variables
190 to measure the size of the hotel: operating revenue, number of employees, total assets, equity,
191 tangible assets, staff costs, operating profit, net profit, working capital and cash flow. In
192 addition, we considered the legal form of the hotel as a proxy for size, as corporations usually
193 are larger than limited liability and limited partnership firms.

194 There is also empirical evidence showing that hotel location matters in price strategies and
195 customer satisfaction and loyalty (Adam & Amuquandoh, 2013; Assaf, Josiassen & Agbola, 2015;
196 Fluvia, Rigall-i-Torrent, Espinet, Garriga & Saló, 2011; Rigall-i-Torrent & Fluvia, 2010; Rigall-i-
197 Torrent, Fluvia et al., 2011; Yang, Luo & Law, 2014). As prices, loyalty and consumer satisfaction
198 are related to the survival of hotels, we hypothesised a link between location of hotels and the
199 probability of survival.

200 Hypothesis 2: *The probability of survival increases with a better location.*

201 We worked with three variables meant to capture different attributes of good locations. The
202 first one refers to whether the hotel is located in a tourist spot, as defined by the Spanish
203 National Statistics Institute. Second, taking into account that the main point of entry in Spain for
204 international visitors is by plane, we considered whether the hotel is located within close range
205 of an airport. Finally, we considered location in particular regions to capture region specific
206 effects.

207 Another dimension expected to affect the duration of hotels is cost structure. When providing
208 services, costs have an impact on price strategy, so the competitive posture of businesses
209 critically depends on their cost structure. There is research literature on the hospitality industry
210 suggesting that vertical differentiation components are associated with pricing strategies that
211 impact quality (Becerra, Santaló & Silva, 2013; Dioko, So & Harrill, 2013) and that hotel chains
212 generate cost savings, induce competition among local tourism services components and
213 facilitate economies of scales (Brookes & Roper, 2012). Therefore, we hypothesised a link
214 between cost structure and hazard rates.

215 Hypothesis 3: *The probability of survival increases with a better cost structure.*

216 We worked with two variables capturing attributes of the quality of the service provided by a
217 hotel – the number of stars and the status of the hotel as a resort – and with two variables
218 related to hotel chains – whether the hotel deposits consolidated accounts in the registry and
219 whether it belongs to a hotel group. Furthermore, like any other company, the way in which a
220 hotel is managed plays an essential role in the future prospects of the hotel. Empirical studies
221 have shown the association between management practices and firm profitability. Laffarga and
222 Pina (1995) and Ferrando and Blanco (1998) showed that the expense ratio, especially

223 employee costs per operation revenue, is a relevant indicator that anticipates situations of
224 corporate insolvency. This produced the following hypothesis:

225 Hypothesis 4: *Better management practices result in a lower probability of hotel failure.*

226 We used three variables to measure good management practices: the ratio of employee costs to
227 operating revenue, the collection period and the profit margin. In addition, there is theoretical
228 and research literature showing the importance of profitability as essential to the survival of
229 companies in the long run. Some authors have confirmed that profitability is an important
230 indicator to anticipate situations of corporate insolvency and justified the use of financial ratios
231 to predict firm failure (Arques & Calvo-Flores, 1995; Bonsón et al., 1997; Ferrando & Blanco,
232 1998; Gabás, 1990; Gallego et al., 1997; García Pérez de Lema, 1995; Laffarga et al., 1985; López
233 et al., 1994; Mora, 1994; Pina, 1989). We, therefore, proposed the following hypothesis:

234 Hypothesis 5: *A sound economic and financial structure of the hotel results in longer duration.*

235 We used a number of financial ratios to test for this hypothesis. These included current ratio,
236 liquidity ratio, solvency ratio, share liquidity ratio, gearing ratio, working capital to equity,
237 working capital to total assets, return on assets, return on shareholders' funds and return on
238 capital employed ratio.

239 Last, there is evidence that firms founded in periods of expansion with low unemployment rates
240 last longer (Audretsch & Mahmood, 1995). The supposition is that being founded in good
241 economic times implies businesses have fewer difficulties in obtaining the required funding.
242 Hence, we proposed a business cycle hypothesis:

243 Hypothesis 6: *Hotels launched in a period of crisis face high hazard rates.*

244

245 3.2 Study context and data

246

247 We worked with a sample of 1,033 hotels opened between 1 January, 1997 and 31 December,
248 2009, of which 79 hotels closed in this period (7.64%). The database was constructed from two
249 main sources of information: (1) the SABI database for all firms in Spain, which collects info
250 from firm registries, since all Spanish firms are required by law to submit their accounting
251 records to the registries on an annual basis, and (2) the *Official Guide to Hotels in Spain*, edited
252 by Turespaña (1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008),
253 which collects information on hotel-specific variables.

254 The SABI database only includes companies with an annual operating revenue in excess of
255 €500,000. This restriction meant that we mainly worked with hotels with three stars or more.
256 In the present study, the exit of a hotel happens when it stops its activity, that is, when it
257 appears in commercial registers as 'not active'. Table 1 displays the variable 'duration' together
258 with the list of covariates used in this analysis, as well as definitions and some basic summary
259 statistics (e.g. the average hotel duration was 3,099.44 days, with a median of 3,286 days).
260 There are three types of variables: dichotomous, continuous and qualitative (using a three-point
261 scale). Monetary variables are expressed in euros deflated to the 2009 euro value.

262

Table 1. Main variables

Name of the variable	Description	Min	Max	Mean	SD
Duration (days)	Survival time	260	4,748	3,099.44	1,089.10

Exit	Dummy variable that takes the value 1 when the hotel is inactive and 0 elsewhere	0.00	1.00	0.08	0.27
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Size hypotheses

Operating revenue (euros)*	Income derived from sources related to a company's everyday business operations	502	229,485	4,744.86	14,930.57
Number of employees (units)	Number of employees	1.00	2,881.00	64.65	186.10
Total assets (euros)*	Total assets	3.28	951,602.40	15,232.36	58,419.71
Equity (euros)*	Equity	-28,358.01	312,600.08	4,374.69	18,674.03
Tangible assets (euros)*	Tangible assets	0.00	910,838.88	12,929.43	52,980.82
Staff costs (euros)*	Staff costs	0.00	94,600.80	1,638.46	5,215.65
Operating profit (euros)*	Operating profit	-7,269.75	12,792.53	123.96	1,099.40
Net profit (euros)*	Net profit	-172,710.72	5,391.96	-318.50	5,563.39
Working capital (euros)*	Working capital	-4,171.10	66,994.00	995.39	3,518.68
Cash flow (euros)*	Cash flow	-144,505.87	18,405.14	165.46	4,669.47
Legal form	1- Corporation; 2- Limited liability society; 3- Limited partnership	1.00	3.00	1.86	0.35

Location hypotheses

Tourism location	Dummy variable that takes the value 1 if the hotel is located in a tourism location and 0 elsewhere	0.00	1.00	0.65	0.48
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Distance from airport (kilometres)

Distance to airport	Number of kilometres to the nearest international airport	0.00	1.00	52.43	54.56
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Region

Andalusia	Dummy variable that takes the value 1 if the hotel is located in Andalusia and 0 elsewhere	0.00	1.00	0.13	0.34
Cantabria	Dummy variable that takes the value 1 if the hotel is located in Cantabria and 0 elsewhere	0.00	1.00	0.11	0.31
Central Peninsula	Dummy variable that takes the value 1 if the hotel is located in Central Peninsula and 0 elsewhere	0.00	1.00	0.11	0.32
Catalonia/Valencia	Dummy variable that takes the value 1 if the hotel is located in Catalonia/Valencia and 0 elsewhere	0.00	1.00	0.29	0.45
Balearic Islands	Dummy variable that takes the value 1 if the hotel is located in Balearic Islands and 0 elsewhere	0.00	1.00	0.17	0.37
Canary Islands	Dummy variable that takes the value 1 if the hotel is located in Canary Islands and 0 elsewhere	0.00	1.00	0.04	0.19
Community of Madrid	Dummy variable that takes the value 1 if the hotel is located in Community of Madrid and 0 elsewhere	0.00	1.00	0.15	0.36

Typology of hotel hypotheses

Hotel chain

Consolidated accounts	Dummy variable that takes the value 1 if the hotel keeps consolidated accounts and 0 elsewhere	0.00	1.00	0.02	0.14
Hotel group	Dummy variable that takes the value 1 if the hotel belongs to a group and 0 elsewhere	0.00	1.00	0.54	0.50

Quality

Category	Number of stars	0.00	1.00	3.66	0.56
Hotel resort	Dummy variable that takes the value 1 if the hotel is a resort	0.00	1.00	0.34	0.47

	and 0 otherwise				
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Management hypotheses

Employee costs/Operating revenue (%)	(Employee costs/Operating revenue)* 100	0.00	145.03	38.22	15.14
Collection period (days)	(Debtors/Operating revenue)* 360	0.00	4,212.07	133.46	255.82
Profit margin (%)	(Pre-tax profit (loss)/Operating revenue)* 100	-206.49	68.35	-6.33	24.26

Economic/Financial structure hypotheses

Financial ratios

Current ratio (%)	(Current assets/Current liabilities)	0.01	34.25	1.34	2.06
Liquidity ratio (%)	((Current assets - stocks)/Current liabilities)	0.01	27.22	1.24	1.90
Solvency ratio (%)	(Shareholders' funds /Total assets)* 100	-199.74	110.85	21.88	38.70
Share liquidity ratio (%)	(Shareholders' funds/Non-current liabilities)	-11,356.00	11,043.82	17.05	583.41
Gearing ratio (%)	((Non-current liabilities + loans)/Shareholders' funds)* 100	-1,064.46	1,010.35	128.47	239.20
Working capital/Equity (%)	(Working capital/Equity)* 100	-166.74	1,202.52	6.18	64.10
Working capital/Total assets (%)	(Working capital/Total assets)* 100	-0.42	210.45	1.01	9.65

Rates of return

Return on assets (%)	(Pre-tax profit (loss)/Total assets)* 100	-285.08	71.29	-2.09	20.87
Return shareholders funds (%)	(Pre-tax profit(loss)/Shareholders' funds)* 100	-1,162.43	907.89	22.13	71.10
Return on capital employed ratio (%)	((Pre-tax profit + Interest paid)/(Shareholders' funds+ Non-current liabilities))* 100	-862.30	754.73	18.05	65.12

Business cycle hypotheses

Year of launch	Year in which the hotel was founded	1,997	2,007	2,000.87	2.98
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* In thousands of euros at 2009 value

263

264 4. RESEARCH METHODOLOGY

265

266 Duration, defined as the time elapsed until a certain event occurs, was analysed using survival
267 models (Allison, 1984; Cox & Oakes, 1984; Hosmer & Lemeshow, 1999; Kalbfleisch & Prentice,
268 2011). In our study, we sought to analyse the duration of Spanish hotels from 1997 to 2009. The
269 use of survival models to model time is based on the fact that the distribution of error in this
270 context is traditionally skewed to the right (Hosmer & Lemeshow, 1999).

271

272 There are several techniques available to estimate survival times, ranging from non-parametric
273 (e.g. Kaplan-Meier analysis) to parametric techniques (e.g. econometric regressions). Since
274 parametric models impose a particular path on the hazards function (Kalbfleisch & Prentice,
275 1980; Lancaster, 1990), these were discarded in the present study, as it did not seem
276 appropriate to impose these restrictions on the model: a more flexible fit was preferred. A semi-
277 parametric regression model of proportional hazards or Cox model can also be used. This was
278 definitely a relevant procedure because it allowed simultaneous analysis of several variables.
279 Given its excellent flexibility, this technique was considered optimal for this study.

280

281 The empirical analysis was carried out in two steps. First, we were interested in assessing the
282 influence of the individual variables in the survival of hotels. This was done using the non-

283 parametric Kaplan-Meier estimator. Second, we undertook a multivariate analysis to evaluate
284 the effect of each explanatory variable, but controlling, each time, for the effects of other
285 independent variables by using the Cox proportional hazards, where the dependent variable is
286 the probability that the hotel is inactive. The Kaplan-Meier estimator was used to detect the
287 possible significance of variables in survival, while the Cox proportional hazards model
288 confirmed this significance and detected signs of influence of any variable analysed, discarding
289 variables that appeared individually significant in the Kaplan-Meier estimator.
290

291 **4.1 Kaplan-Meier estimator**

292
293 The Kaplan-Meier estimator is one of the most widely used in academic research, as it is a non-
294 parametric estimator with extremely few restrictions. Indeed, the only restriction to consider is
295 that the observed companies – if the data are censored – are assumed to have continued
296 behaving the same way as they did until the death event occurred. This is called non-
297 informative or random censorship. Non-informative or random censorship occurs when each
298 observation has a censoring time independent of the time of a company's death. The observed
299 survival time is the minimum between censorship and exit time.

300 To apply this model of survival, all observed survival times were ordered from shortest to
301 longest. For each of these periods, we were interested in knowing the number of exits and
302 censures produced. For each time, the individual probability of survival function, accumulated
303 over time, was found with the Kaplan-Meier estimator.

304 To compare the survival functions across groups of firms according to the different values for r
305 of explanatory variables, the log-rank test statistic was used. Under the null hypothesis, the
306 different groups have an equal chance of survival, so it has a chi-squared distribution with $r - 1$
307 degrees of freedom.

308 **4.2 Cox regression model**

309
310 The Kaplan-Meier estimator allowed a preliminary analysis of the duration or survival of
311 Spanish hotels. However, to analyse the effects of variables on the duration of hotels properly, a
312 model was constructed to take into account the effect of all the independent variables
313 simultaneously.

314 The Kaplan-Meier estimator's validity rested on the two assumptions that the hotels removed
315 from the study had a similar fate as hotels that remained and that the time during which a hotel
316 was part of the study had no independent effect on the results. Once a time survival function
317 was obtained, it was relevant to investigate whether risk differed systematically between hotels.
318 This led the researchers to identify the explanatory variables of the hazard function.

319 To cope with the observed heterogeneity more accurately, a vector X of variables was
320 introduced into the model, where each element represented the feature vector of hotel i at time
321 t . This approach was adjusted using the Cox model, which uses the following hazards model
322 specification:

$$323 \quad h_i(t) = h_0(t) \times e^{X_i\beta}$$

324 where the hazards that hotel i faces at time t is multiplicatively proportional to the baseline
325 function $h_0(t)$ – which is left unspecified – and the proportionately factor depends on the set X
326 of explanatory variables. The exponential specification has the advantage that the coefficient of
327 one covariate (i.e. hazards ratio) has a direct interpretation: the constant proportional effect of
328 a unit increase of this variable on the conditional probability of exiting.

329 There are four assumptions in the proportional hazards model:

330 (1) The hotels do not influence the model estimation.

331 (2) The hotels do not influence the estimation of each model parameter.

332 (3) Unobserved heterogeneity is assumed to be absent.

333 (4) A suitable functional form exists for each assumed continuous covariate.

334 In estimating the Cox model, we followed Collet's (1994) standard procedure, which
335 recommends adding covariates sequentially, one at a time, and keeping a covariate in the final
336 estimation if it improves the likelihood value of the model. Finally, in order to avoid problems of
337 multicollinearity, survival analysis excluded certain variables.

338

339 5. RESULTS

340

341 This section first briefly presents the results of the log-rank non-parametric tests of equality of
342 survival functions in Table 2, in which the dependent variable is the hotel duration measured in
343 days. For each given covariate, different groups of hotels defined by different thresholds were
344 implemented, to assess whether the relevance of the covariate on the hotel survival rate was
345 achieved when the covariate surpassed a critical magnitude.

346 The results suggest that there were factors that did not influence the survival functions of
347 Spanish hotels from 1997 to 2009. None of the different variables meant to capture size,*
348 typology of hotel and financial structure affected the probability of exiting, whereas factors
349 related to geographical location, legal form and business cycle did. In particular, those hotels
350 that were launched after 2003 endured significantly different probabilities of survival than their
351 counterparts, at the 1% level of statistical significance. Those hotels located more than 100
352 kilometres away from an airport showed the same level of statistical significance. The
353 remaining significant factors enjoy a level of statistical significance of 5% and 10%. The overall
354 picture is that survival critically depends on distance to an airport, a location in certain
355 geographical areas, the legal form of management and the business cycle.

Table 2. Non-parametric tests of equality of survival functions by explanatory variable

Explanatory variable	Log-rank	P-value
<i>Size</i>		
Operating revenue		
Less than 1 million	0.065	0.799
Between 1 and 2 million	0.123	0.725
Between 2 and 4 million	0.201	0.654
More than 4 million	1.035	0.309
Number of employees		
Less than 10	1.012	0.314
Between 10 and 50	0.234	0.629
More than 50	1.362	0.243
Total assets		
Less than 1.5 million	0.154	0.694
Between 1.5 and 6 million	0.621	0.431
More than 6 million	0.147	0.702
Equity (less than 500)	0.031	0.861
Tangible assets (less than 2,000)	0.000	0.996
Staff costs (less than 600)	0.000	0.993
Operating profit (less than 35)	0.080	0.777

Net profit (negative)	1.698	0.193
Working capital (more than 300)	0.159	0.690
Cash flow (more than 80)	0.059	0.808
Legal form	6.435**	0.040

Location

Tourism location	0.436	0.509
Distance to an airport		
Less than 25 km	0.639	0.424
Between 25 and 100 km	0.970	0.325
More than 100 km	6.550***	0.010
Andalusia	0.359	0.549
Cantabria Region	1.662	0.197
Central Peninsula	2.864*	0.091
Catalonia/Valencia	4.190**	0.041
Baleares	0.269	0.604
Canary Islands	0.887	0.346
Community of Madrid	5.876**	0.015

Typology of hotel

Hotel resort	0.026	0.873
Consolidated accounts	1.523	0.217
Hotel group	0.188	0.664
Category		
Three-star/Four-star/Five-star	2.919	0.232
Three-star	1.075	0.300

Management

Costs of employees/operative revenue		
Less than 33%	0.241	0.623
Between 33 and 43%	1.667	0.197
More than 43%	3.119*	0.077
Collection period		
Less than 40 days	1.084	0.298
Between 40 and 90 days	0.263	0.608
More than 90 days	0.193	0.660
Profit margin (%)		
Negative	0.398	0.528
Positive and smaller than 2%	0.031	0.859
Larger than 2%	0.625	0.429

Economic/Financial structure

Liquidity		
Less than 0.5	0.346	0.556
Between 0.5 and 1	0.150	0.699
More than 1	0.870	0.351
Return on shareholders' funds (%)		
Negative	0.087	0.768
Positive and smaller than 25%	1.169	0.280
More than 25%	0.461	0.497
Return on capital employed ratio		
Negative	0.126	0.723

	Between 0 and 10	0.371	0.542
	More than 10	0.090	0.764
Current ratio (smaller than 1%)		0.822	0.365
Solvency ratio (larger than 20%)		1.310	0.252
Share liquidity ratio (larger than 1%)		0.374	0.541
Gearing ratio (smaller than 80%)		0.161	0.688
Working capital/equity (smaller than 50%)		0.239	0.625
Working capital/total assets (smaller than 10%)		0.528	0.468
Return on assets (positive)		1.539	0.215

Business cycle

Hotel launched			
	Between 1997 and 1999	1.095	0.295
	Between 2000 and 2002	4.197**	0.041
	Between 2003 and 2009	30.938***	0.000

356

357 We next reviewed the semi-parametric Cox model, which was used to confirm significance and
358 indicate sign and intensity of the different factors. The estimation results are shown in Table 3,
359 which displays the hazards ratio and level of significance. The dependent variable was the
360 probability that a hotel exits the market, and the hazards ratio indicated the effect on the risk of
361 exiting of a unitary change in the variable (i.e. in the case of dummy variables, it gave the effect
362 on the risk rate of a change from 0 to 1 in the corresponding variable).

Table 3. Cox estimation model

Variable	Hazards ratio	P-value
<i>Size</i>		
Operating revenue	1.000	0.701
Number of employees	1.003	0.496
Total assets	1.000**	0.037
Equity	1.000**	0.047
Working capital	1.000	0.269
Cash flow	1.000	0.384
Legal form (corporation)	0.485**	0.011
<i>Location</i>		
Tourism location	0.822	0.465
Distance to airport more than 100 kilometres	3.677**	0.039
Location: Cantabria Region	0.919	0.857
Location: Central Peninsula	1.912	0.298
Location: Catalonia/Valencia	1.935*	0.106
Location: Balearic Islands	1.505	0.365
Location: Canary Islands	2.423	0.283
Location: Community of Madrid	0.726	0.453
<i>Typology of hotel</i>		
Hotel resort	0.644	0.247
Consolidated accounts	1.999	0.941
Hotel group	0.937	0.801
Category: four or five-star	1.255	0.371
<i>Management</i>		
Costs of employees/Operating revenue: more than 43%	1.938**	0.035
Collection period: between 40 and 90 days	1.462	0.200
Collection period: more than 90 days	1.333	0.405
Profit margin	0.988**	0.072
<i>Economic/Financial structure</i>		
Current ratio	1.163	0.668

Liquidity ratio	0.889	0.750
Gearing ratio	1.001	0.274
Working capital/Equity	1.002	0.282
Return on assets	1.012	0.232
Return on shareholders' funds	1.000	0.987
Return on capital employed ratio	0.997	0.313
<i>Business cycle</i>		
Year of launch between 2003 and 2009	0.150***	0.000
<hr/>		
Log-likelihood	-476.491	
Number of hotels	1,033	
Number of events	79	

363

364 On the one hand, regarding the internal factors that are firm-specific, the survival of a hotel
365 from 1997 to 2009 clearly depended on the legal form (i.e. the hotel being a corporation) and on
366 management practices. The hazards ratio for the legal form is 0.485 (statistically significant at
367 nearly the 1% level), implying that the odds of a corporation of exiting the market are half that
368 of a limited liability or limited partnership hotel, controlling for all other variables. In addition,
369 there are two more variables within the size category that help the model to fit better (i.e.
370 equity and total assets), which are statistically significant at the 5% level, but whose hazards
371 ratios are basically one – meaning that the impact of an increase of 1,000 euros on the
372 probability of exiting the market is basically null.

373 Management practices proved to be important in shaping the probability of exiting the market.
374 The odds of exiting for hotels with an employee costs/operating revenue ratio above 43% are
375 twice that of their counterparts. In addition, the profit margin ratio is likewise significant at the
376 5% level: the hazards rate is smaller than one, meaning that more profits on sales indicate a
377 decreased risk of exit.

378 On the other hand, in terms of external factors, the results suggest that geographical location –
379 in particular, being close to an airport and, marginally, in the Catalonia/Valencia region – and
380 business cycle affect the probability of exit. Hotels located further than 100 kilometres away
381 from the nearest airport are three times more likely to close down than their counterparts are.
382 Being located in the Catalonia/Valencia region also increases the odds of exiting the market by
383 two. Finally, those hotels launched after 2003 had a larger probability of survival.

384

385 6. DISCUSSION

386

387 We started this research with hypotheses concerning the effect of several factors on the
388 probability of survival of Spanish hotels from 1997 to 2009. These factors were size, location,
389 typology, management, economic and financial structure and business cycle.

390 Regarding the effect of size, our initial assumption was that larger hotels are more likely to
391 survive than smaller ones. Although the association of size and survival has been noted by a
392 number of authors, service sector data revealed no consensus on this. We were extremely
393 careful while defining up to 10 different variables to pick up any size effect in the sample.
394 Among these, our preferred choice was revenues and number of employees. Another variable
395 that can be considered as a proxy for size is the legal form of the hotel, because corporations –
396 unlike other legal forms (i.e. limited liability societies or limited partnerships) – are legally
397 required to comply with minimum capital requirements, as well as number of employees. This
398 ultimately implies that corporations are larger firms than non-corporation hotels.

399 Our results concerning Hypothesis 1 were mixed. The non-parametric Kaplan-Meier estimator
400 identified 'legal form' as a determining factor in hotels' survival, and this result was validated by
401 econometric estimates through a multivariate Cox model, controlling for the effects of other
402 variables. Although the statistical significance of the variable 'legal form' is nearly at the 1%
403 level, our results cannot be considered conclusive since none of the alternative variables
404 defined to measure hotel size (e.g. revenues or number of employees) was ultimately
405 determined to affect the survival probability of hotels significantly. Hence, our research
406 confirms the findings of the rest of the service sector literature, in which empirical studies have
407 not been able to dismiss clearly the presence of economies of scales in the hotel sector.

408 Hypothesis 2 concerns the positive effect of 'location' on survival. This proposal is based on an
409 opinion that is widespread in the hospitality industry: that location determines hotels' rates of
410 occupancy and the average income expected from the rental of each room. Following this logic,
411 better locations mean more profits and, accordingly, better prospects for hotels. The issue
412 however, seems to lie in the likely trade-off between locating the hotel in traditional destination
413 locations, where the competitive pressure is higher, or in a location lacking tourism
414 infrastructure, but where competition is less fierce.

415 To verify this hypothesis, we defined three types of variables. The first, 'location in a tourism
416 destination', was meant to capture any direct effect based on the traditional wisdom that, to be
417 successful, hotels need to be located where tourism demand exists. The second variable, based
418 on the distance to the nearest international airport, was used as a proxy for locations where
419 competition and tourism demand are less intense. This variable was meant to capture the
420 capacity of hotels for creating their own demand in order to survive in places lacking tourism
421 infrastructure. Finally, dummy variables for the most important Spanish regions were included
422 to capture any region-specific effect on survival probability. A possible source of regional-
423 specific effects is the different tourism policies found in different Spanish regions, as many
424 functions are decentralised, having been transferred to regional governments. Among those,
425 fiscal competences are shared by the central and regional governments.

426 According to non-parametric estimates, Hypothesis 2 cannot be rejected, as location is a
427 relevant factor affecting survival probability. In this approach, the survival of hotels depends on
428 being located within 100 kilometres from an international airport and in certain regions:
429 Catalonia and Valencia, the Central Peninsula and the Community of Madrid. However, the
430 multivariate model only validates distances greater than 100 kilometres from an airport, and,
431 only marginally, locations in eastern Spain (Catalonia and Valencia). There is no conclusive
432 evidence of region specific effects on hotel survival, suggesting that the decentralisation of
433 tourism policies – including fiscal competences – at the regional level has not created noticeably
434 unequal opportunities across regions. In addition, our results suggest that hotels cannot
435 successfully attract tourists if they are located away from main entry points.

436 Regarding the relationship between the types of hotel and survival probabilities, this study has
437 not succeeded in detecting any variable that influences probability of survival. At first glance,
438 resort and urban hotels are quite different businesses. Although both have similar management
439 issues, the cost structure and seasons are quite different. Resort hotels are heavily influenced by
440 seasonality, while urban hotels are extremely customer-centric companies. Although resorts
441 and urban hotels are ex-ante different, there are no relevant differences in the survival
442 dimension, according to the results of this study.

443 This study has not found significance in belonging to a chain or not. Two proxy variables for this
444 concept were studied to test this hypothesis, including if hotels deposit consolidated accounts
445 belonging to a hotel group. There are pros and cons of belonging to a group. Among the pros,
446 cost reduction associated with economies of scale or financial shields are clear advantages,
447 while one aspect that can compromise the long-term viability of hotels is increased competition

448 among hotels within chains. According to our research, the positive and negative sides balance
449 each other out, so there is no net effect linked to chain membership. Hence, Hypothesis 3 is
450 rejected.

451 Management practices were included in this work because control over certain variables –
452 mainly personnel costs and profits – certainly increases the chances of firm survival in any
453 industry and, in particular, within the hospitality industry. Regarding the variable ‘ratio of
454 employee costs to operating revenues’, we tested many different thresholds to ascertain at
455 which value management practices jeopardise the continuation of hotels. It turns out that
456 excellent management (a ratio below 33%) or good management (values between 33% and
457 43%) are equivalent in terms of hazard rates, and only those firms with poor management skills
458 (values over 43%) perform significantly worse. In addition to controlling personnel costs, our
459 research identified another dimension that affects chances of survival: the ratio of profits to
460 sales. Hypothesis 4 is accepted since these two empirical results reinforce that management is
461 an important dimension for survival. However, rather than pursuing excellence in hotel
462 management – good management does not necessarily ensure a higher probability of survival –
463 it is critical not to let management practices deteriorate.

464 Information on financial variables obtained from financial statements has been shown to
465 predict firm failure elsewhere. This is intuitively sound because it is important, for example, to
466 have reduced financial leverage in order to avoid bankruptcy or to have higher benefits
467 compared to firm size to guarantee the survival of companies. Early studies, including Altman
468 (1968), who focused on financial ratios such as working capital to total assets, equity to total
469 assets or sales to total assets, and Aziz, Emanuel and Lawson (1988), who focused on cash flows,
470 all confirmed these assumptions and, thereby, gave rise to the extensive literature dealing with
471 models for predicting business failure. It was hypothesised that a financially compensated
472 balance positively influences the survival of hotels. However, our analysis baldly rejects
473 Hypothesis 5. None of the economic or financial variables used in this study has any effect at all
474 on the probability of survival.¹

475 We can think of two potential explanations for this negative result. The first is that those studies
476 that develop models for business failure tend to work exclusively with financial information.
477 Although this might seem at first restrictive, it is important to bear in mind that their main goal
478 is not descriptive (e.g. finding the reasons why a firm ultimately fails) but predictive: they are
479 interested in finding a model that, based on financial information, maximises the accuracy of
480 predictions. However, in our study, we considered a large range of financial and non-financial
481 variables, and it may well be that the financial constraints that eventually lead to failure of firms
482 also have an impact on non-financial variables, so our econometric estimation might have
483 picked up on non-financial variables instead. To test for this hypothesis, we re-estimated the
484 Cox model using only financial ratios, and the results were negative: no single financial ratio has
485 a significant effect on probability of survival.

486 A second possible explanation is that, while most papers work with companies from a diversity
487 of industries, our research focused on the Spanish hospitality sector, and, in this industry, there
488 are significant barriers to exiting. In fact, there are a number of hotels that continue in the
489 market (e.g. they do not appear in the registries as inactive) although they are in financial
490 distress. In the database, there are 154 active hotels (15% of the sample) that functioned with
491 negative own funds over a sequence of years. This would indicate a limitation of the SABI

¹ Financial ratios, especially those focusing on cash flows, are affected by tax policy, as firm taxes are deducted from cash flows. The fact that no financial ratio affects the probability of survival suggests that taxes are not a major determinant of the duration of hotels. See Aziz et al. (1998) and Mossman, Bell, Swartz and Turtle (1998) for a discussion along these lines.

492 database for performing failure prediction analyses using financial ratios in the hospitality
493 industry.

494 Last, our final hypothesis was related to the effect of the business cycle on the survival chances
495 of the hotel. In fact, our results show that Hypothesis 6 is neatly confirmed. The general
496 economic environment is the most significant variable influencing the duration of hotels,
497 dividing by six the odds of hotels exiting the market as compared to their counterparts.

498

499 **7. LIMITATIONS AND FURTHER RESEARCH**

500 Our paper contributes to the empirical literature on the analysis of hotel survival. We explore
501 two sets of variables that the literature suggests that affects hotel survival probabilities:
502 financial and non-financial variables. Data on financial variables provided by SABI refer to firms
503 with annual operating revenue in excess of €500,000, restricting the sample to hotels with three
504 stars or more. Hence, our conclusions only apply to hotels with three stars or more. It might
505 well be the case that some conclusions, for example, the absence on impact of the financial and
506 economic structure on the survival probability, only hold for relatively large hotels, but it makes
507 an impact on smaller hotels. Hence, further research should extend the analysis to cover a wider
508 range of hotels.

509 A second aspect related to the sample is the period of time that the paper analyses. This study
510 considers hotels born between 1997 and 2009, both inclusive. This period of time is
511 characterized by a steady increase in overnight stays from 200 million to the peak in 2007 with
512 270 million stays; then an 8% drop in 2009 because of the economic crisis that started in 2008.
513 Certainly, economic recession has an impact on hotel exits that our modelling strategy does not
514 explicitly address, although it is captured indirectly because the economic crisis hits the hotel
515 industry through weaker tourist demand and more stringent financing conditions, so hotels
516 with different qualities (as for different tourist segments), size, location, and economic and
517 financial structures, etc will be affected differently by the crisis and will display different exit
518 behaviour (as this research has highlighted). To this respect, it is noticeable that the exit rates in
519 2008 and 2009 are of the same magnitude than that of 2006. A proper analysis of the impact of
520 the economic crisis on exit rates is an interesting topic left for future research.

521 Finally, from a methodological point of view, our analysis is robust to the use of non-parametric,
522 Kaplan-Meier estimator, and semi-parametric analysis, Cox regressions of proportional hazards,
523 but we have not used any parametric regression analysis.

524

525 **8. CONCLUSIONS**

526
527 This study analysed survival in the Spanish hotel industry, using non-parametric Kaplan-Meier
528 estimators and semi-parametric regression through the Cox proportional hazards model on a
529 sample of 1,033 hotels launched between 1997 and 2009. An important difference with
530 previous studies on firm survival is that our sample incorporated both financial and non-
531 financial variables that allowed us to perform a complete analysis of firm-specific factors and
532 external factors that affect the probability of survival of Spanish hotels.

533 Many of these significant factors depend on entrepreneurs' choices, and, therefore, our results
534 can help these actors select optimal strategies that increase their firms' chances of survival.
535 From an internal point of view, we conclude that a clear separation between ownership and
536 management is important to increase the chances of survival, and, in fact, management is far

537 more important than the economic and financial structure of hotels. Our research has been
538 unable to identify any single financial ratio that has a significant impact on the duration of
539 hotels. Perhaps the only relevant factor within the financial and economic sphere is the
540 economic conditions at the time of the hotel's launch – especially those linked to easy access to
541 funds to finance investment – which are by and large the most important single variable
542 affecting the survival of hotels. Clearly, investment in hotels needs to be a procyclical rather
543 than an anticyclical activity.

544 Unlike financial and economic dimensions, the managerial aspect of firms is a variable to which
545 entrepreneurs should pay attention, to adapt to changing environments optimally. Our results
546 suggest that management is extremely important since having a good manager is crucial for
547 survival. Hotel operators need to control primarily personnel costs and profit margins.

548 As there are no survival differences across types of hotels, not much thought should be given to
549 this in the planning stage. In this stage, however, there is one critical decision that
550 entrepreneurs need to make correctly: location. Transport and accommodation are the two
551 most important factors in tourism consumers' choice of final destinations, and the survival of
552 hotels is inevitably linked to conveniently accessible destinations. This study shows the
553 importance of transport in the success of final tourism products.

554 In addition, location necessitates a trade-off between placing hotels where the demand is – at
555 the risk of facing strong competition – or else where competition is less fierce. Our results show
556 that location needs to tilt to the demand side. This dynamic reinforces the geographically
557 clustered structure of the tourism sector in Spain, with overcrowded areas that attract most
558 visitors and less developed areas/regions that struggle to attract tourism. Reversing this
559 dynamic is not easy, so this research highlights the role of the public sector and a need for joint
560 commercial decisions by different agents involved in tourism within the same destination. The
561 success of a less developed area cannot be created by entrepreneurs alone since hotels placed in
562 the wrong areas are doomed to disappear, given that it is difficult to attract enough demand to
563 those destinations where a key link in the chain of tourism consumption (i.e. transport) does
564 not develop at the same time as hotels.

565 That the main factor in determining hotel survival within the location dimension is proximity to
566 international airports suggests their use as a policy instrument. In actuality, the public sector in
567 Spain has promoted and funded many airports throughout Spain in the last 15 years, although
568 with mixed results: a majority of airports are non-profitable and a few show no activity.

569

570 REFERENCES

571

572 Acs, Z. J. & Audretsch, D. B. (1989). Births and firm size. *Southern Economic Journal*, 56, 467–475.

573 Adam, I. & Amuquandoh, F. E. (2013). Dimensions of hotel location in the Kumasi Metropolis,
574 Ghana. *Tourism Management Perspectives*, 8, 1–8.

575 Alegre, J. & Pou, L. (2006). The length of stay in the demand for tourism. *Tourism Management*,
576 27(6), 1343–1355. doi:10.1016/j.tourman.2005.06.012

577 Allison, P. D. (1984). *Event history analysis. Sage University paper series on quantitative*
578 *applications in the social sciences, series num. 07-001*. Beverly Hills and London: Sage.

579 Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate
580 bankruptcy. *Journal of Finance*, 23(4), 589–609.

- 581 Assaf, A. G., Josiassen, A. & Agbola, F. W. (2015). Attracting international hotels: Locational
582 factors that matter most. *Tourism Management*, 47, 329–340.
- 583 Audretsch, D. B. (1991). New firm survival and the technological regime. *The Review of*
584 *Economics and Statistics*, 73, 441–450.
- 585 Audretsch, D. B., Klomp, L. & Thurik, R. (1997). *Do services differ from manufacturing? The post-*
586 *entry performance of firms in Dutch services*. Retrieved from
587 <http://core.ac.uk/download/pdf/6891747.pdf>
- 588 Audretsch, D. B. & Mahmood, T. (1995). New firm survival: New results using a hazard function.
589 *Review of Economic and Statistics*, 77, 97–103.
- 590 Audretsch, D. B. & Mata, J. (1995). The post-entry performance of firms: Introduction.
591 *International Journal of Industrial Organisation*, 13(4), 413–419.
- 592 Audretsch, D. B., Santarelli, E. & Vivarelli, M. (1999). Start-up and industrial dynamics: Some
593 evidence from Italian manufacturing. *International Journal of Industrial Organisation*, 17,
594 965–983.
- 595 Aziz, A., Emanuel, D. C. & Lawson, G. H. (1988). Bankruptcy prediction – an investigation of cash
596 flow based models. *Journal of Management Studies*, 25(5), 419–437.
- 597 Bain, J. (1956). *Barriers to new competition: Their character and consequences in manufacturing*
598 *industries*. Cambridge: Harvard University Press.
- 599 Barros, C. P., Butler, R. & Correia, A. (2010). The length of stay of golf tourism: A survival
600 analysis. *Tourism Management*, 31(1), 13–21. doi:10.1016/j.tourman.2009.02.010
- 601 Barros, C. P., Correia, A. & Crouch, G. (2008). Determinants of the length of stay in Latin
602 American tourism destinations. *Tourism Analysis*, 13(4), 329–340.
- 603 Barros, C. P. & Machado, L. P. (2010). The length of stay in tourism. *Annals of Tourism Research*,
604 37(3), 692–706.
- 605 Baum, J. A. & Ingram, P. (1998). Survival-enhancing learning in the Manhattan hotel industry,
606 1898–1980. *Management Science*, 44(7), 996–1016.
- 607 Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 4,
608 71–102.
- 609 Becerra, M., Santaló, J. & Silva, R. (2013). Being better vs. being different: Differentiation,
610 competition, and pricing strategies in the Spanish hotel industry. *Tourism Management*,
611 34, 71–79.
- 612 Brookes, M. & Roper, A. (2012). Realising plural-form benefits in international hotel chains.
613 *Tourism Management*, 33(3), 580–591.
- 614 Caves, R. E. (1998). Industrial organisation and new findings on the turnover and mobility of
615 firms. *Journal of Economic Literature*, 36, 1947–1982.
- 616 Cox, D. R. & Oakes, D. (1984). *Analysis of survival data*. London and New York: Chapman & Hall.
- 617 Dioko, L. A., So, S. I. A. & Harrill, R. (2013). Hotel category switching behaviour – evidence of
618 mobility, stasis or loyalty. *International Journal of Hospitality Management*, 34, 234–244.

- 619 Disney, R., Haskel, J. & Heden. Y. (1999). *Entry, exit and establishment survival in UK*
620 *manufacturing* (Working paper 1999/9). Nottingham, UK: GEP Centre, University of
621 Nottingham.
- 622 Dunne, P. & Hughes, A. (1994). Age, size, growth and survival: UK companies in the 1980s. *The*
623 *Journal of Industrial Economics*, 42, 115–140.
- 624 Dunne, T., Roberts, M. J. & Samuelson, L. (1988). Patterns of firm entry and exit in US
625 manufacturing industries. *Journal of Industrial Economics*, 35(4), 567–581.
- 626 Dunne, T., Roberts, M. J. & Samuelson, L. (1989). The growth and failure of US manufacturing
627 plants. *Quarterly Journal of Economics*, 104, 671–698.
- 628 Evans, D. S. (1987). The relationship between firm growth, size and age: Estimates for 1,000
629 manufacturing industries. *Journal of Industrial Economics*, 35(4), 567–581.
- 630 Evans, L. B. & Siegfried, J. J. (1992). Entry and exit in United States manufacturing industries
631 from 1977 to 1982. In D. B. Audretsch & J. J. Siegfried (Eds.), *Empirical studies in honour*
632 *of Leonard W. Weis* (pp. 319–330). The Netherlands: Kluwer.
- 633 Ferrando, M. & Blanco, F. (1998). La previsión del fracaso empresarial en la Comunidad
634 Valenciana: Aplicación de los modelos discriminante y logit. [Forecasting business
635 failures in the Valencia Community: Application of discriminate and logit models].
636 *Revista Española de Financiación y Contabilidad*, 27(95), 499–540.
- 637 Fluvià, M., Rigall-i-Torrent, R., Espinet, J.M., Garriga, A. & Saló, A. (2011). Precios implícitos de
638 los atributos de los productos turísticos: ¿Qué esconde el efecto de la localización?
639 [Implicit costs in the attributes of tourism products: What hides the location's effect?]. In
640 *Estudios de economía aplicada* [Applied economics studies] (Vol. 29–3), (pp. 781–802).
- 641 Fotopoulos, G. & Spence, N. (1998). Entry and exit from manufacturing industries: Symmetry,
642 turbulence and simultaneity – some empirical evidence from Greek manufacturing
643 industries, 1982–1988. *Applied Economics*, 30(2), 245–262.
- 644 Geroski, P. (1995). What do we know about entry? *International Journal of Industrial*
645 *Organisation*, 13, 421–440.
- 646 Gibrat, R. (1931). *Les inégalités économiques* [Economic inequalities]. Paris: Librairie du Recueil
647 Sirey.
- 648 Gokovali, U., Bahar, O. & Kozak, M. (2007). Determinants of length of stay: A practical use of
649 survival analysis. *Tourism Management*, 28(3), 736–746.
650 doi:10.1016/j.tourman.2006.05.004
- 651 Hall, B. H. (1987). The relationship between firm size and firm growth in the U.S. manufacturing
652 sector. *Journal of Industrial Economics*, 35, 583–605.
- 653 Hemmington, N. (2007). From service to experience: Understanding and defining the hospitality
654 business. *The Service Industries Journal*, 27(6), 747–755.
- 655 Hosmer, D. W. & Lemeshow, S. (1999). *Applied survival analysis: Regression modeling of time to*
656 *event data*. New York: John Wiley and Sons, Inc.

- 657 Instituto de Estudios Turísticos. (2013). Balance del turismo: Resultados de la actividad
658 turística en España [Assessment of tourism: Results of tourism activities in Spain].
659 Madrid: Ministerio de Industria, Turismo y Comercio
- 660 Jovanovic, B. (1982). Selection and the evolution of industry. *Econometrica*, 50, 649–670.
- 661 Kalbfleisch, J. D. & Prentice, R. L. (2011). *The statistical analysis of failure time data* (Vol. 360).
662 New York: John Wiley & Sons.
- 663 Kaniovski, S., Peneder, M. & Smeral, E. (2008). Determinants of firm survival in the Austrian
664 accommodation sector. *Tourism Economics*, 14(3), 527–543.
- 665 Klepper, S. (1996). Entry, exit, growth, and innovation over the product life cycle. *American*
666 *Economic Review*, 86(3), 562–583.
- 667 Klepper, S. & Simons, K. L. (2000). The making of an oligopoly: Firm survival and technological
668 change in the evolution of the US tire industry. *Journal of Political Economy*, 108, 728–
669 760.
- 670 Laffarga, J. & Pina, V. (1995). La utilidad del análisis multivariante para evaluar la gestión
671 continuada de las empresas [The usefulness of multivariate analysis to evaluate the
672 ongoing management of businesses]. *Revista Española de Financiación y Contabilidad*,
673 727–748.
- 674 Love, J. H. (1996). Entry and exit: A county level analysis. *Applied Economics*, 28(4), 441–451.
- 675 Mansfield, E. (1962). Entry, Gibrat's Law, innovation, and the growth of firms. *American*
676 *Economic Review*, 52, 1023–1051.
- 677 Marshall, A. (1920). *Principles of economics* (8th ed.). London: Macmillan.
- 678 Martinez-Garcia, E. & Raya, J. M. (2008). Length of stay for low-cost tourism. *Tourism*
679 *Management*, 29(6), 1064–1075. doi:10.1016/j.tourman.2008.02.01
- 680 Mata, J., Portugal, P. & Guimaraes, P. (1995). The survival of new plants: Start-up conditions and
681 post-entry evolution. *International Journal of Industrial Organisation*, 13, 459–481 and
682 35, 607–627.
- 683 Mossman, C. E., Bell, G. G., Swartz, L. M. & Turtle, H. (1998). An empirical comparison of
684 bankruptcy models. *Financial Review*, 33(2), 35–54.
- 685 Nelson, R. R. & Winter, S. G. (1982). *An evolutionary theory of economic change*. Cambridge:
686 Belknap Press/Harvard University Press.
- 687 Nurmi, S. (2006). Sectoral differences in plant start-up size in the Finnish economy. *Small*
688 *Business Economics*, 26(1), 39–60.
- 689 Pan, C. M. (2005). Market structure and profitability in the international tourist hotel industry.
690 *Tourism Management*, 26(6), 845–850.
- 691 Peypoch, N., Randriamboarison, R., Rasoamananiara, F. & Solonandrasana, B. (2012). The length
692 of stay of tourists in Madagascar. *Tourism Management*, 33(5), 1230–1235.
693 doi:10.1016/j.tourman.2011.11.003

- 694 Rigall-i-Torrent, R. & Fluvià, M. (2010). Managing tourism products and destinations embedding
695 public good components: A hedonic approach. *Tourism Management*, 32, 244–255.
- 696 Rigall-i-Torrent, R., Fluvià, M., Ballester, R., Saló, A., Ariza, E. & Espinet, J. M. (2011). The effects
697 of beach characteristics and hotel location with respect to the beach on hotel prices.
698 *Tourism Management*, 32, 1150–1158.
- 699 Schumpeter, J. A. (1934). *The theory of economic development*. Cambridge, MA: Harvard
700 University Press.
- 701 Segarra, A. (2002). *La creación y la supervivencia de las empresas industriales* [The creation and
702 survival of industrial firms]. Madrid: Biblioteca Civitas, Economía y Empresa, Colección
703 Economía.
- 704 Segarra, A., Arauzo, J. M., Gras, N., Manjon, M., Mane, F, Teruel, M. & Theilen. B. (2002). *La*
705 *creación y la supervivencia de las empresas industriales* [The creation and survival of
706 industrial firms]. Madrid: Colección Economía, Civitas Ediciones.
- 707 Segarra, A., Arauzo, J. M., Manjon, M. & Martin, M. (2002). Demografía industrial y convergencia
708 regional en España [Industrial demography and regional convergence in Spain]. *Papeles*
709 *de Economía Española*, 93, 65–78.
- 710 Segarra, A. & Callejón, M. (2002). New firms' survival and market turbulence: New evidence
711 from Spain. *Review of Industrial Organisation*, 20, 1–14.
- 712 Segarra, A. & Teruel, M. (2007). Creación y supervivencia de las nuevas empresas en las
713 manufacturas y servicios [Creation and survival of new companies in manufacturing and
714 services]. In (eds.), *Economía industrial número 363. Dedicado a emprendedores e*
715 *innovación en España* [Industrial economics number 363. Dedicated to entrepreneurs
716 and innovation in Spain] (pp. 47–58).
- 717 Sutton, J. (1997). Gibrat's legacy. *Journal of Economic Literature*, 35, 40–59.
- 718 Thrane, C. (2012). Analysing tourists' length of stay at destinations with survival models: A
719 constructive critique based on a case study. *Tourism Management*, 33(1), 126–132.
720 doi:10.1016/j.tourman.2011.02.011
- 721 Turespaña. (1996). *Guía oficial de hoteles de España 1997* [Official guide to hotels in Spain
722 1997]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 723 Turespaña. (1997). *Guía oficial de hoteles de España 1998* [Official guide to hotels in Spain
724 1998]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 725 Turespaña. (1998). *Guía oficial de hoteles de España 1999* [Official guide to hotels in Spain
726 1999]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 727 Turespaña. (1999). *Guía oficial de hoteles de España 2000* [Official guide to hotels in Spain
728 2000]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía y
729 Hacienda.
- 730 Turespaña. (2000). *Guía oficial de hoteles de España 2001* [Official guide to hotels in Spain
731 2001]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 732 Turespaña. (2001). *Guía oficial de hoteles de España 2002* [Official guide to hotels in Spain
733 2002]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.

- 734 Turespaña. (2002). *Guía oficial de hoteles de España 2003* [Official guide to hotels in Spain
735 2003]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 736 Turespaña. (2003). *Guía oficial de hoteles de España 2004* [Official guide to hotels in Spain
737 2004]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 738 Turespaña. (2004). *Guía oficial de hoteles de España 2005* [Official guide to hotels in Spain
739 2005]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 740 Turespaña. (2005). *Guía oficial de hoteles de España 2006* [Official guide to hotels in Spain
741 2006]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 742 Turespaña. (2006). *Guía oficial de hoteles de España 2007* [Official guide to hotels in Spain
743 2007]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 744 Turespaña. (2007). *Guía oficial de hoteles de España 2008* [Official guide to hotels in Spain
745 2008]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 746 Turespaña. (2008). *Guía oficial de hoteles de España 2009* [Official guide to hotels in Spain
747 2009]. Madrid: Secretaría de Estado de Comercio y Turismo, Ministerio de Economía.
- 748 UNWTO. (2012). *World Tourism Organisation*. Retrieved from <http://unwto.org/en>. Accessed 6
749 June, 2015.
- 750 Wagner, J. (1994). The post-entry performance of new small firms in German manufacturing
751 industries. *The Journal of Industrial Economics*, 42(2), 141–154.
- 752 Wang, E., Little, B. B. & Delhomme-Little, B. A. (2012). Factors contributing to tourists' length of
753 stay in Dalian, northeastern China – a survival model analysis. *Tourism Management*
754 *Perspectives*, 4, 67–72. doi:10.1016/j.tmp.2012.03.005
- 755 Yang, Y., Luo, H., & Law, R. (2014). Theoretical, empirical, and operational models in hotel
756 location research. *International Journal of Hospitality Management*, 36, 209–220.