



Environmental certification and Spanish hotels' performance in the 2008 financial crisis

José Antonio Caveró-Rubio & Aracelí Amorós-Martínez

To cite this article: José Antonio Caveró-Rubio & Aracelí Amorós-Martínez (2020): Environmental certification and Spanish hotels' performance in the 2008 financial crisis, Journal of Sustainable Tourism, DOI: [10.1080/09669582.2019.1705316](https://doi.org/10.1080/09669582.2019.1705316)

To link to this article: <https://doi.org/10.1080/09669582.2019.1705316>



Published online: 03 Jan 2020.



Submit your article to this journal [↗](#)



View related articles [↗](#)



View Crossmark data [↗](#)



Environmental certification and Spanish hotels' performance in the 2008 financial crisis

José Antonio Caveró-Rubio and Aracelí Amorós-Martínez

Department of Economics and Financial Studies, Miguel Hernández University of Elche, Elche, Alicante, Spain

ABSTRACT

Limited funds available in times of financial crisis may lead hotel managers to deem environmental actions dispensable. Hence, the need to analyze whether hotels that decided to maintain environmental management measures during the 2008 crisis better withstood its negative effects. The aim of this study is to analyze whether environmental management influenced the performance of Spanish hotels during the 2008 crisis. Through the panel data technique, a comparison is made of how sales, workers and assets management affected the financial performance of hotels with and without environmental certification EMAS and ISO 14001 in the period prior to the financial crisis (2002–2007) and during it (2008–2013). The results demonstrate that, while for non-certified hotels, the effect of sales, workers and assets management on financial performance worsened in the crisis period, for certified hotels it remained the same. In addition, no evidence has been obtained to show that the financial performance of certified hotels was higher than non-certified hotels in either the period prior to the crisis or during it. Nevertheless, the general results confirm that certification permitted Spanish hotels to cope better with the crisis since the adverse effects were less severe than for the non-certified hotels.

ARTICLE HISTORY

Received 20 November 2018
Accepted 10 December 2019

KEYWORDS

Environmental certification; financial performance; financial crisis; EMAS; ISO 14001; hotel industry

Introduction

Environmental management is the means by which companies can simultaneously avoid or reduce the negative environmental impact of their activity and reach competitive advantages (Porter, 1991; Porter & Van Der Linde, 1995). Companies aim to preserve the environment by implementing the processes and mechanisms required for supervising and verifying the impact of their activity on the environment. Environmental management can help companies achieve a win-win situation in which companies and the environment both benefit (Pereira-Moliner et al., 2015; Neugebauer, 2012). For this reason, environmental responsibility has come to be considered a highly important strategic competitive variable. Environmental improvements allow companies to reduce costs by increasing internal efficiency, increase differentiation by improving public image (Bonilla Priego, Najera, & Font, 2011; Leonidou, Leonidou, Fotiadis, & Zeriti, 2013) and, ultimately, improve their financial performance (Molina-Azorín, Claver-Cortés, Pereira-Moliner, & Tarí, 2009b).

The relation between environmental management and financial performance has received considerable attention in the literature during the last few decades. Although in general the studies have revealed a positive relation, the results obtained are contradictory, inconsistent and inconclusive (Hoffman & Bansal, 2012). In addition, the inconsistency caused by the methodological and theoretical heterogeneity of these studies makes it impossible to obtain evidence about the direction of this relation (Aragón-Correa & Sharma, 2003; Russo & Minto, 2012). In order to obtain a consensus in the literature and to draw some general conclusions, the contradictory results obtained in the different studies have been aggregated in a meta-analysis (Endrikat, Guenther, & Hoppe, 2014; Ambec & Lanoie, 2008; Combs, Ketchen, Crook, & Roth, 2011). In this context, meta-analyses involve applying a contingency focus to answer the question When does it pay to be green? instead of Does it pay to be green? (Kallio & Nordberg, 2006; Albertini, 2013; Sharma & Starik, 2002). They have revealed that contingent variables play a decisive role in the relation between environmental management and financial performance (Horváthová, 2010; Orlitzky, Schmidt, & Rynes, 2003; Dixon-Fowler, Slater, Johnson, Ellstrand, & Romi, 2013).

In this sense, the periods of financial crisis are a contingency factor which has a powerful influence on the relation between environmental management and financial performance. In periods of financial recession, as in 2008, the shortage of economic resources presents managers with the complex dilemma of deciding the direction of the organization's environmental policy (Fernández-Feijóo Souto, 2009). On the one hand, abandoning or reducing environmental actions because they are considered dispensable (Karaibrahimoğlu, 2010; Wagner & Schaltegger, 2004). On the other hand, in line with Gallego-Álvarez, García-Sánchez, and da Sil Vieira (2014), continuing to use environmental management tools because they are expected to positively affect the financial performance of the organization.

However, although there are numerous studies that have analyzed the effects of the 2008 financial crisis, hardly any attention has been given to the relation between financial performance and environmental proactivity during crisis periods. Consequently, it is necessary to broaden the scope of research to obtain evidence and shed light on the direction of this relation. In this sense, this is an innovative study in comparison with the previous literature. An analysis has been made about whether environmental practices have allowed hotels to obtain competitive advantages, which in turn mitigate or eliminate the negative effects of the 2008 crisis on their financial performance. In this way, managers will be provided with arguments for determining the direction of their environmental decisions during financial recession periods. Besides, hotel managers, public administrations, suppliers, investors and clients will gain knowledge about how the financial policies carried out to maintain environmental measures in periods of crisis influence the financial performance of hotels.

It is well known that in general Spanish tourism and, in particular Spanish hotels, is one of the sectors to have been affected by the 2008 financial crisis (Perles-Ribes, Ramón-Rodríguez, Sevilla-Jiménez, & Moreno-Izquierdo, 2016). In 2008 and 2009 the percentage of hotel occupation dropped 10% (TOURSPAIN, 2019), the GDP variation in the tourism sector fell 7.23% (EXCELTUR, 2019) and employment in the hotel industry was 3.11% (National Statistics Institute (INE), 2018). In addition, it is a sector that has a high economic importance both globally and in Spain, which justifies the relevance and the usefulness of this study. According to the World Travel and Tourism Council (WTTTC), (2017), in 2016 tourism represented 10.2% of global Gross Domestic Product and one out of ten workers. In Spain, in 2017 the number of employees in tourism was 11.62% of the employed population, and in hotels it represented 1.31% (TOURSPAIN, 2019). In 2016, Spain was the Member State of the European Union with the highest tourism revenue, 16.03%, and the second worldwide, 4.95% (World Tourism Organization (UNWTO), 2017).

With all this in mind, since environmental certification through international standards is the most commonly used environmental practice (Chan & Wong, 2006; Segarra-Oña, Peiró-Signes, Verma, & Miret-Pastor, 2012), the aim of this study is to analyze how the 2008 financial crisis

affected the financial performance of Spanish certified and non-certified hotels. Although environmental certification is not the only variable used to explain the relation between environmental management and financial performance (Rivera, 2002; Kassinis & Soteriou, 2005), there is extensive literature that has used environmental certification to study this relation in the hotel sector (Bonilla Priego & Avilés Palacios, 2008; Peiró-Signes, Segarra-Oña, Verma, Mondéjar-Jiménez, & Vargas-Vargas, 2014). In this respect, environmental certification can improve the image of hotels, which will allow them to achieve a competitive advantage in differentiation and hence increase sales (Sharma, Aragón-Correa, & Rueda-Manzanares, 2007). In addition, certification can improve workers' efficiency and assets management in a company, allowing it to obtain a competitive cost advantage (Bonilla Priego et al., 2011; Porter & Van Der Linde, 1995). This certification can also enable hotels to gain competitive advantages that improve their financial performance (Corbett, Montes-Sancho, & Kirsch, 2005; Geerts, 2014).

To obtain evidence of the relationship between the impact of sales, workers and assets management on financial performance of hotels with and without environmental certification EMAS and ISO 14001, a longitudinal study from 2002 to 2013 was conducted. In the study, we analyzed the financial performance of Spanish hotels with and without environmental certification in the period prior to the financial crisis (2002–2007) and during it (2008–2013). Through a t-student test and the implementation of a panel data technique, the statistical study has shown that the crisis did not affect certified hotels. The effect of sales, workers and assets management on the financial performance of certified hotels remained invariable in the crisis period compared to the period before the crisis. In contrast, for non-certified hotels, the impact of these variables in the crisis period worsened, so they were negatively affected. In addition, despite confirming that certification permitted Spanish hotels to cope better with the crisis than the non-certified hotels, no evidence has been obtained to show that the financial performance of certified hotels was higher than non-certified hotels in either the period prior to the crisis or during it.

Literature review

Environmental management, competitive advantage and financial performance of hotels

The relation between environmental management and financial performance is not direct. Nevertheless, a proactive environmental attitude will probably have a favorable effect on the development of new resources and skills, which will help to gain competitive advantages and improve the financial performance of organizations. In this sense, Juvan and Dolnicar (2017) state that the majority of hotels have adopted an environmentally proactive attitude to obtain competitive advantages which will allow them to attract clients and reduce costs, and thereby increase long-term profitability. According to Leonidou et al. (2013), Pereira-Moliner et al. (2015), differentiation competitive advantage (resulting from a good environmental reputation), and cost differentiation, (resulting from a reduction in resource consumption and the implementation of more efficient processes) can be used to measure the financial performance of hotels.

The relation between the financial performance and environmental management of hotels is an aspect that has been the subject of extensive study in academic literature. However, although most note a positive influence (Pereira-Moliner et al., 2015), the results obtained about the direction of this relation are diverse, contradictory and altogether inconclusive (Molina-Azorín, Claver-Cortés, López-Gamero, & Tarí, 2009a). As shown in Table 1, authors such as Carmona-Moreno, Céspedes-Lorente, and De Burgos-Jiménez (2004) determined that environmental practices translate into an improvement in environmental performance, although they are not accompanied by improved financial results. In the same line, López-Gamero, Molina-Azorín, and Claver-Cortés (2011) found evidence that hotels did obtain significant differentiation advantages and an improved image among clients, but they did not achieve cost advantages. What is more, Claver-Cortés, Molina-Azorín, Pereira-Moliner, and López-Gamero (2007) found that

Table 1. Studies linking environmental management and financial performance of hotels.

Study	Sample	Financial performance variables	Methodology	Major findings
Carmona-Moreno et al. (2004)	268 4–5 stars Spanish hotels	Hotel's profitability (perceptual measures)	Factorial analysis. Cluster analysis. ANOVA	Hotels in the groups with more developed environmental strategies are associated with a higher level of environmental performance but not necessarily with economic performance
López-Gamero et al. (2011)	240 3–5 stars Spanish hotels	Added value growth, economic and financial profitability (perceptual measures)	Structural equation modelling	Positive relationships of proactive environmental management and improved environmental performance with competitive advantage on differentiation and financial performance
Claver-Cortés et al. (2007)	114 3–5 stars Spanish hotels in Alicante state	Occupancy rate per room and bed, gross operative profit (GOP), GOP per available room per day (GOPPAR per day)	Cluster analysis. ANOVA	Performance levels increase as environmental proactivity grows. GOP and GOPPAR did not vary significantly in relation to the environmental strategy adopted by the hotels
Vargas Sanchez and Levy Mangin (2008), Leonidou et al. (2013)	26 3–5 stars Spanish hotels in Huelva state 410 4–5 stars Greek hotels and a minimum capacity of 50 beds	Competitiveness, costs, economic growth. Market performance and financial performance (perceptual measures)	Cluster analysis. Structural equation modelling Structural equation modeling	Proactive environmental strategies obtained competitive advantages that contributed to improving financial results Environmental marketing strategy is conducive to obtaining competitive advantage, which subsequently increases the potential to achieve superior market and financial performance
Álvarez Gil et al. (2001)	262 3–5 stars Spanish hotels	Current-year profitability, profitability over the last 3 years, and average occupancy rate of present year	Exploratory factor analysis. Cluster analysis-Multiple regression analysis. ANOVA	Positive relationship between environmental management practices and firms' financial performance. This positive relation was associated to size, age and belonging to a hotel chain
García Rodríguez and Armas Cruz (2007)	80 3–5 stars Spanish hotels	ROA	Two successive regression models	Strong and positive relation between social and environmental responsibility and firm performance
Molina-Azorín et al. (2009b)	301 3–5 stars Spanish hotels	Occupancy rate per room, gross operative profit (GOP), GOP per available room per day (GOPPAR per day)	Cluster analysis. Regression analysis	Significant positive relationship between the degree of environmental proactivity of hotels and their business performance
Kassinis and Soteriou (2005)	104 hotels with different levels of luxury in Europe	Profit growth, revenue growth, market share (perceptual measures)	Structural equation modelling	Environmental management practices are positively related to firm results, through the mediating effect of customer satisfaction and loyalty
Pereira-Moliner et al. (2012)	259 3–5 stars Spanish hotels	Financial performance, market success and stakeholder satisfaction (perceptual measures)	Partial least square	Environmental management affect positively financial performance, market success and stakeholder satisfaction

results for occupancy per day and per room did not vary significantly in relation to the environmental strategy adopted by the hotels.

In contrast, Vargas Sanchez and Levy Mangin (2008), Leonidou et al. (2013) observed that hotels with proactive environmental strategies obtained competitive advantages that contributed to improving financial results. In the same line, Álvarez Gil, Burgos Jiménez, and Céspedes

Lorente (2001) also ascertained that this positive relation was associated to size, age and belonging to a hotel chain. García Rodríguez and Armas Cruz (2007), Molina-Azorín et al. (2009b) also determined that environmental commitment positively influenced the financial performance of hotels. Kassinis and Soteriou (2005) noted that environmental practices indirectly had a positive impact on financial results since they showed an increase in customer satisfaction and loyalty. Similarly, Pereira-Moliner, Claver-Cortés, Molina-Azorín, and Tarí (2012) obtained evidence that the development of environmental actions could indirectly and positively affect business results.

Environmental certification and financial performance in the hotel industry

Although there are numerous variables used for measuring environmental management, environmental certification has been widely used to measure the relation between environmental management and the financial performance of hotels (Rodríguez-Antón, Alonso-Almeida, Celemin, & Rubio, 2012; Segarra-Oña et al., 2012). In this context, environmental certification can improve a hotel's image and generate savings in costs, both of which create competitive advantages. The benefits of environmental certification also extend to internal and human operational improvements. These lead to more efficient production processes which permit the reduction in resource consumption and consequently costs (Chan & Ho, 2006; Chan & Wong, 2006; Bonilla Priego et al., 2011).

In addition, environmental certification is a source of differentiation in the hotels' pursuit of social legitimization and client approval, and positively influences their reputation and image. Differentiation advantage increases commercialization opportunities, consumer demand and the hotel's ability to commercialize its products and services. In this way, there is a greater likelihood of increasing sales, sale prices and consequently income (Peiró-Signes et al., 2014). As a result, the implementation of certification could enable hotels to gain sustainable and long-term competitive advantages which could have a positive impact on their financial performance (Corbett et al., 2005; Geerts, 2014).

According to Bonilla (2008), the Spanish hotel industry led the way with environmental certifications. In fact, hotels are high on the list of firms that have adopted the most used environmental certifications: ISO 14001 and the Eco-Management and Audit Scheme (EMAS). ISO 14001 along with EMAS are the two principal international standards used to obtain environmental certification. Although both are applied voluntarily, the adoption of ISO 14001 surpasses that of EMAS (Heras, Arana & Boiral, 2016; Testa et al., 2014). Currently, ISO 14001 has been certified in 350,000 organizations in 191 countries (International Organization for Standardization [ISO], 2017), while EMAS has certified around 4,000 organizations in the 28 member countries of the European Union (European Commission, 2016). Spain is third in Europe for the number of ISO 14001 and EMAS certificates with 11.96% and 23.99%, respectively. In the European Union, the hotel sector is the activity with the fourth highest number of EMAS certificates, representing 4.62%. As EMAS is a widely used certification among Spanish hotels (Bonilla Priego & Avilés Palacios, 2008), Spain is first in number of certified EMAS hotels, with 36.78% (European Commission, 2016). Globally, the hotel sector represents about 4.72% of ISO 14001 certification in the services sector.

As previously mentioned, there are studies that have used environmental certification to analyze the relation between environmental management and financial performance in the hotel sector. In this regard, Table 2 shows that on average booking revenue neither increased nor decreased for certified hotels, as found by Chong and Verma (2013). In contrast, Claver-Cortés, Pereira-Moliner, Molina-Azorín, and Tarí-Guilló (2010) concluded that Spanish certified hotels obtained better results in total gross annual profit and per room and per day. They also verified that financial performance is higher according to the number of stars, size and belonging to a chain. Similarly, Segarra-Oña et al. (2012) showed that large certified hotels situated in urban and

Table 2. Studies linking environmental certification and financial performance in the hotel industry.

Study	Sample	Certification	Financial performance variables	Methodology	Major findings
Chong and Verma (2013)	3,727 certified hotels and 7,187 not certified hotels around the world	Sabre's Eco-Certified Hotel Program	Booking revenue	Differences-in-differences statistical Methodology. Panel data method	Eco-certification has statistically zero impact on revenue for the hotel industry overall
Claver-Cortés et al. (2010)	109 certified and 194 not certified. 3-5 stars Spanish hotels	ISO 9001 and/or Q ICTE. ISO 14001, EMAS and/or Green Q ICTE	Occupancy rate per room, gross operative profit (GOP), GOP per available room per day (GOPPAR per day).	Factorial analysis	Certified hotels achieve better results in the three performance variables. The relationship between certification and the result is indirect
Segarra-Oña et al. (2012)	2,116 Spanish hotels. 108 hotels have certification	ISO 14001	Trading income, net sales, profit margin, EBITDA, ROA and ROE	ANOVA. Linear regression	The results showed significant differences in the economic performance of ISO-certified hotels and those not certified, particularly for urban and beach hotels
Rivera (2002)	164 Costa Rican hotels. 52 hotels with certification	Certification for Sustainable Tourism Program	Price and sales	Recursive two-stage estimation method. Probit regression model. Ordinary least squares regression	Participation in the program alone is not significantly related to higher prices and higher sales
Peiró-Signes et al. (2014)	6,854 3-5 stars Spanish hotels. 350 hotels have certification	ISO 14001	Market competitive advantage	ANOVA	The guests rate the hotels with ISO 14001 certification is higher than those without the certification. Hotels may be able to get a distinctive asset that leads them to a competitive advantage
Segarra-Oña et al. (2014)	6,854 3-5 stars Spanish hotels. 350 hotels have certification	ISO 14001	Market competitive advantage	ANOVA	Hotels with certification exhibited a positive effect on the customers' decision formation. Hotels certified may be able to acquire a distinctive asset that leads them to a competitive advantage, particularly those in upscale market segments

beach areas, obtained better trading income, net sales, profit margin, EBITDA, ROA and ROE. For his part, Rivera (2002) indicated that Costa Rican certified hotels showed a positive relationship with sales. Finally, Peiró-Signes et al. (2014), Segarra-Oña, Peiró-Signes, Verma, Mondejar-Jimenez, and Vargas-Vargas (2014), after analyzing the client satisfaction ratings for 6,859 certified and non-certified hotels in Spain, concluded that certification can provide a competitive advantage.

Financial performance of hotels in times of crisis

Even though the literature has brought to light the serious impact that the different crises have had on hotels, less attention has been given to analyzing the impacts of the financial crises on hotels. With respect to the 2008 financial crisis, research is fundamentally aimed at studying the effects on variables related to demand (Campos-Soria, Inchausti-Sintes, & Eugenio-Martin, 2015; Ritchie, Amaya Molinar, & Frechtling, 2010). Based on the studies by Song, Lin, Witt, and Zhang (2011), Li, Blake, and Cooper (2010), Perles-Ribes, Ramón-Rodríguez, Sevilla-Jiménez, and Rubia (2016), although the 2008 financial crisis reduced demand and spending on tourism, it did not affect all tourist destinations equally, since they reported the existence of geographical and temporal asymmetries per country.

Two factors make Spain an ideal exponent for studying the effects of the crisis on hotels' financial performance, they are: country asymmetries and the fact that tourism is one of the most important economic sectors. In this respect, as summarized in Table 3, Alonso-Almeida and Bremser (2013) determined that the crisis did not have an immediate negative impact on the performance of individual hotels. In the same line, Deng, Veiga, and Wiper (2019) stated that Spanish hotel chains increased overall revenue. In contrast, Lado-Sestayo, Otero-González, Vivel-Búa, and Martorell-Cunill (2016) determined that the crisis negatively influenced the financial performance of hotels, although the effects were not the same for all tourist destinations. In a subsequent study, Vivel-Búa, Lado-Sestayo, and Otero-González (2019) found that ROA, cash flow and asset turnover had a positive effect on survival of hotels, and indebtedness had a negative effect. Finally, García-Pozo, Sánchez-Ollero, and Ons-Cappa (2016), González-Rodríguez, Martín-Samper, and Giuliani (2015) confirmed a drop in prices and sales, an accumulated decrease in profits and also a reduction in the productivity of hotels.

With respect to the latter point, other authors confirmed that hotels with better productivity can better face financial crises (Alonso-Almeida, Llach, Barquero, & Bremser, 2016). However, Cordero and Tzeremes (2017) demonstrated that only the first two years of the economic downturn had negative effects on hotel productivity. Another relevant aspect of the crisis was its effect on employment, where we can also find mixed results. On the one hand, Perles-Ribes, Ramón-Rodríguez, Sevilla-Jiménez, and Moreno-Izquierdo (2016) found a decrease in the number of employees. Meanwhile, Cordero and Tzeremes (2018) suggested on average hotels' labor productivity withstood the financial crisis. Yrigoy and Cañada (2019) arrived at similar conclusions, finding that the labor devaluation caused by the economic crisis helped to enhance its economic performance.

Relationship between environmental certification and financial performance of hotels in times of crisis

It is also indisputable that the hotel sector is one of the sectors where the effects of the crisis had a negative economic impact (Kimes, 2009; Alonso-Almeida & Bremser, 2013). Most previous studies have ascertained that hotels' financial performance was negatively affected during the period of the financial crisis. However, the studies that analyze the impacts of financial crises on the hotels that have implemented environmental management measures are practically non-existent. Hence, the need and the justification for this study, which aims to shed light on the relation between the financial performance of hotels and the use of an environmental management tool during the 2008 financial crisis.

According to Miras, Escobar, and Carrasco (2014), Muhammad, Scrimgeour, Reddy, and Abidin (2015), Ritchie et al. (2010), Song et al. (2011), in order to obtain evidence about whether the crisis influenced the hotels, an analysis should be made about whether there are differences between the financial performance of hotels before and during the crisis period. In line with Chong and Verma (2013), to achieve this, two groups have been established: a treatment group

Table 3. Studies linking crisis and financial performance in the Spanish hotel industry.

Study	Sample	Period	Financial performance variables	Methodology	Major findings
Alonso-Almeida and Bremser (2013)	134 hotels from Madrid	2009	Costs, income, performance	Factorial analysis. Logistic Regression	The research does not support that the crisis had an immediate negative impact up on the performance of individual hotels. The hotels considered best performers reduced costs but did not suffer a decrease in sales. Hotels worst performers are not able to decrease costs but are forced to decrease their prices
Deng et al. (2019)	44 of the largest Spanish hotel chains	2014	Total operating revenue, average room price, cash flow, operating expenditure	Stochastic frontier analysis model	In the period of the economic crisis, it was better, in terms of revenue efficiency, for hotel chains to invest in hotels of three or fewer stars than in higher star rated hotels
Lado-Sestayo et al. (2016)	8992 Spanish hotels	2005–2011	Profit margin = EBIT/ revenues	Dynamic panel data models using the GMM method. Static panel data	The profitability of Spanish hotels depends on the characteristics of the tourist destination. Profitability depends on the market concentration and the occupancy rate in each tourist destination. The crisis period negatively influence the profit margin
Vivel-Búa et al. (2019)	11,558 micro, small, and medium-sized Spanish hotels	2007–2015	ROA, indebtedness, cash flow, current ratio, working capital and asset turnover	Cox model, exponential model, Weibull model, and Gompertz model	ROA, cash flow, and asset turnover have a positive impact on hotel survival, while indebtedness and size have a negative effect
García-Pozo et al. (2016)	173 3-5 stars Andalusian hotels	2008–2012	Labour productivity	Cobbe Douglas production function	The introduction of eco-innovative measures had a positive and significant influence on labour productivity
González-Rodríguez et al. (2015)	38 hotels of the AC chain	2007–2010	Performance, sales, profit, productivity	DEA Malmquist productivity index	The recession period negatively affected performance, decreased sales and profits. Hotel managers had to implement cost-reduction plans. Results show a negative change in productivity
Alonso-Almeida et al. (2016)	7,293 Spanish hospitality companies	2008–2011	Hotel growth. Year-to-year logarithmic variations in the number of employees.	Multivariate regression analysis	This finding confirms a stronger influence from human resources on competitive operational performance and growth during crisis. Hotels with better productivity can better face financial crisis
Cordero and Tzeremes (2017)	758 hotels located in the Balearic Islands and the Canary Islands	2004–2013	Hotel productivity	Malmquist productivity index	The results reveal that the economic downturn had major negative effects on hotel productivity for 2 years (2008 and 2009). After that period, hotels have increased their productivity levels driven by both technological and catching-up changes
Perles-Ribes et al. (2016)	138 tourist destinations located on the Spanish	2007–2012	Increases in the unemployment rates	Ordinary least squares (OLS). Panel	During the crisis, residential destinations experienced a greater destruction of employment than hotel destinations. Economic

(continued)

Table 3. Continued.

Study	Sample	Period	Financial performance variables	Methodology	Major findings
	Mediterranean coastline, the Balearic and the Canary Islands			data analysis	crises negatively affect the performance of tourist destinations
Cordero and Tzeremes (2018)	820 Spanish hotels from Balearic and Canary	2007–2012	Labour productivity: change in efficiency, technology change and change in the capital–labour ratio.	Generalized least squares regression	The results indicate that most hotels have been able to adapt to shortage in the demand during the crisis making progress in their labour productivity levels
Yrigoy and Cañada (2019)	Spanish hotel corporation, NH Hotels	2013	Labour devaluation	Case study	Labour devaluation helped to enhance the economic performance of NH Hotels in the recession period. Labour devaluation implied an ‘improvement’ of the corporation’s image. It helped to improve the corporation’s economic performance ratios, and smooths the process of revaluing hotel assets

(hotels during the crisis) and a control group (hotels before the crisis). For each group, measures of the variables studied before and after the contingency are carried out to determine whether there are differences. For each hotel observation before the crisis in the first group, there is a related observation in the second group. The data obtained respond to financial performance observations made for each hotel in the different study periods, before and after the crisis. If the effects of the variables have remained the same before and after the crisis, it could be confirmed that the crisis did not influence hotels’ financial performance (Alonso-Almeida et al., 2016; Segarra-Oña et al., 2012).

On the basis of these considerations, this relation will be studied with respect to certified and non-certified hotels. To determine whether environmental certification influenced the financial performance of hotels during the 2008 financial crisis compared with the previous crisis period, the following hypotheses have been posed:

H1: The financial performance of certified hotels was negatively affected in the period of financial crisis compared to the period prior to the financial crisis.

H2: The financial performance of non-certified hotels was negatively affected in the period of financial crisis compared to the period prior to the financial crisis.

Next, to compare certified and non-certified hotels, following Segarra-Oña et al. (2012), García Rodríguez and Armas Cruz (2007), Lado-Sestayo et al. (2016), we contrast the financial performance of the certified hotels with non-certified hotels in the crisis period. This is a commonly used procedure in the literature about environmental management which compares the results of certified firms with the results of non-certified firms (Heras-Saizarbitoria, Molina-Azorín, & Dick, 2011). As it is logical to assume that the crisis reduced the financial performance of both certified and non-certified hotels, we propose the following hypothesis:

H3: The financial performance of certified hotels was higher than the financial performance of the non-certified hotels in the period of financial crisis.

Table 4. Economic indicators prior to and during the financial crisis.

Indicator	Prior to the crisis (2002–2007)	During the crisis (2008–2013)
Variation rate of the GDP	2.9%	–0.93%
Unemployment with respect to the tourism sector	70.57%	74.69%
Unemployment with respect to the services sector	15.23%	19.84%
Hotel price index	94.57%	93.51%
Income per hotel room	2,729 euros	2,597 euros
Percentage of hotel occupancy	55%	52%

In this context, in order to conduct a better understanding of the results obtained, it is also necessary to analyze the situation before the crisis period. To do so, a comparison will be made of the financial performance of certified hotels and non-certified hotels in the period prior to the crisis. Therefore, the hypothesis established is:

H4: The financial performance of certified hotels was higher than the financial performance of non-certified hotels in the period prior to the financial crisis.

As explained above, environmental certification can influence internal benefits, which improve production procedures and employees' skills and abilities. It can also imply external benefits that improve the image of the organization, client satisfaction and market participation. Consequently, in order to analyze the effect of certification on the financial performance of hotels, in line with the studies by Segarra-Oña, Miret-Pastor, and Peiró-Signes (2011), Rivera (2002), De Jong, Paulraj, and Blome (2014), Caveró-Rubio and Amorós-Martínez (2017), Bonilla Priego et al. (2011), Corbett et al. (2005), the explanatory variables of financial performance included are: sales, workers and assets management. In addition, given that the effects of environmental certification on financial performance can vary according to the characteristics of the hotels, in line with the studies by Bonilla Priego and Avilés Palacios (2008), Claver-Cortés et al. (2010), Peiró-Signes et al. (2014), Segarra-Oña et al. (2012), size, location and category have been taken into account.

In summary, in order to contrast these hypotheses, a distinction has been made by establishing two groups of hotels: Spanish hotels with certification and hotels without certification. Two periods have also been defined: the period prior to the financial crisis and the other period corresponding to the years of the crisis. Consequently, in H1 and H2, the financial performances of certified and the non-certified hotels, respectively, have been compared for the period prior to the crisis with those for the period during the crisis. On the other hand, in hypotheses H3 and H4, the financial performances of certified and non-certified hotels, respectively, have been compared during the crisis period and in the period prior to the crisis.

Methodology

Sample

In line with the studies by Corbett et al. (2005), a longitudinal study covering the two periods (prior to the crisis 2002–2007 and during the crisis 2008–2013) has been carried out. According to Kimes (2009), Miras et al. (2014), Ritchie et al. (2010), Song et al. (2011), 2008 has been taken as the year the crisis started. As can be observed in Table 4, the data from National Statistics Institute (INE), (2019), EXCELTUR (2019) and TOURSPAIN (2019) show that it is during the crisis period, as defined for the study, when the effects of the crisis on the hotel sector in Spain are most visible and pronounced. Although the effects of the crisis abated and there were signs of recovery, the economic indicators revealed that the crisis continued to affect the hotel sector, but to a lesser extent. For this reason, we chose the years from 2008 to 2013 as the financial years that better represent the crisis period.

Table 5. Hotel population selection process.

Search criterion	N° of excluded hotels	N° of valid hotels
Code NACE I.5510		13,307
Hotel is not in active operation	5,435	7,872
Annual reports not available for all the periods	6,402	1,470
NACE I.5510 in conjunction with other NACE's	415	1,055
No individual hotel	329	726
The hotel that the company manages is unknown	274	452
Unreliable annual reports	91	361
Incomplete hotel data for all the periods	21	340
Incomplete accounting data	76	264
Incoherent accounting data	36	228

The target hotels of this study are individual hotels with an independent legal status. They own their property and are managed and controlled independently. As such, they present individual financial statements. In a primary selection process, the hotels were selected in exactly the same way as in the studies by Segarra-Oña et al. (2012), García Rodríguez and Armas Cruz (2007), Lado-Sestayo et al. (2016), from the database of the Iberian Balance Sheet Analysis System (SABI) (Bureau Van Dijk, 2016). The variable used for the search was code I.5510 "Hotels and similar accommodation" from the statistical classification of economic activities in the European Community (NACE). As shown in Table 5, after excluding the hotels whose database information was insufficient, incomplete, or did not meet the requirements for analysis, the primary hotel population was 361.

In a secondary selection process, the hotels were divided into two groups: certified and non-certified. The group of certified hotels comprises hotels that had been certified by ISO 14001 or EMAS in the period 2002 to 2013. The study period 2002 to 2013 has meant that the number of certified hotels available for the period would provide enough data to carry out the study (Ferron, Funchal, Nossa, & Teixeira, 2012). A longer period would have reduced the number of certified hotels significantly, which would have limited the scope of the study.

The sample of certified hotels was obtained by verifying whether the primary hotel population, 361, was included in the EMAS database of organizations registered with the European Commission (European Commission, 2016). EMAS, unlike ISO 14001, is a detailed and updated database that guarantees the availability of a reliable register that is accessible and open to certified companies. The ISO 14001 certification, however, does not have a centralized database or provide public access to ISO 14001 certified companies. Therefore, it was necessary to use other means to verify whether the hotel had this certification. In this sense, firstly, searches were made on the databases for the leading certification companies in Spain: Spanish Association for Standardisation and Certification (AENOR), Bureau Veritas, TÜV Rheinland Ibérica Inspection, Certification & Testing, S.A. and SGS ICS IBÉRICA (Geerts, 2014). In some cases, national, regional and provincial institutional databases were used (De Jong et al., 2014). Given that the internet is an interactive and relatively economical medium for companies to show their environmental commitment and publicize their certification, hotel websites were also visited (Parguel, Benoit-Moreau, & Larceneux, 2011; Koe Hwee Nga, 2009; Peiró-Signes et al., 2014). When there was any doubt or the necessary information was not available the hotel was contacted directly (Alonso-Almeida & Rodríguez-Antón, 2011; Heras-Saizarbitoria et al., 2011). The non-certified hotels were obtained from the hotels that had not been certified during this period.

In this selection process, hotels, whose data for the variables used in this study were not available, incomplete or they presented unreliable accounting data, were excluded. The final population was 228 hotels, 41 certified and 187 non-certified. Table 5 shows the process for obtaining the final hotel population. Finally, a simple random sample was created for each group with a confidence level of 95% and sample error of 1%. The number of hotels to be studied in

Table 6. Variables analysed.

Variable	Description	Abbreviation
Return on assets	Earnings Before Interest and Taxes/Total assets	ROA
Revenue growth	$(\text{Revenues year}^t - \text{Revenues year}^{t-1})/(\text{Revenues year}^{t-1})$	RG
Net operating income per employee	Net operating income/Number of employees	NOIPE
Asset turnover	Revenues/Total assets	AT
Size of the hotel	Logarithm of total number of employees	SIZE
Category of the hotel	Yes = 1 if the hotel has 4–5 stars No = 0 otherwise	STARS
Location of the hotel	Yes = 1 if the hotel is situated in a coast location No = 0 otherwise	BEACH
Hotel certified	Yes = 1 if the hotel is certified No = 0 otherwise	CERT
Economic period	Yes = 1 during the crisis (2008–2013) No = 0 prior to the crisis (2002–2007)	CRISIS

Table 7. Distribution hotel size, stars and beach in the sample.

Variables		NoCERT		CERT	
		Observations (hotels)	%	Observations (hotels)	%
Large Size	Yes	48 (4)	1.18%	60 (5)	12.20%
	No	1,992 (166)	98.82%	432 (36)	87.80%
4-5 Stars	Yes	864 (72)	42.35%	456 (38)	95.12%
	No	1,176 (98)	57.65%	36 (3)	4.88%
Beach	Yes	1,188 (99)	58.24%	420 (35)	85.37%
	No	852 (71)	41.76%	72 (6)	14.63%
Pooled sample		2,040 (170)		492 (41)	

each group resulting from this random sample was the total population for certified hotels, 41 (492 observations) and 170 non-certified hotels (2,040 observations).

Data and variables

Table 6 defines the dependent and independent variables, both continuous and dichotomous, used to contrast the hypotheses stated.

As shown in Table 6, the variable used to measure financial performance was return on assets. ROA is viewed by many researchers as a stable variable and more indicative of the efficient use of an organization's facilities. Additionally, ROA is the indicator commonly used to measure the financial performance of organizations. And, based on the previous studies by De Jong et al. (2014), King and Lenox (2002), Muhammad et al. (2015), Heras-Saizarbitoria et al. (2011), ROA is also commonly used as dependent variable to measure financial performance in studies about environmental management.

As indicated previously, the explanatory variables of ROA to be included are the effect that certification can have on sales, workers and assets management. Based on extant literature, the financial ratios used to measure the explanatory variables are, respectively: revenue growth; net operating income per employee, and asset turnover (Corbett et al., 2005; De Jong et al., 2014; Segarra-Oña et al., 2011; Caveró-Rubio & Amorós-Martínez, 2017; Rivera, 2002; Hazudin, Mohamad, Azer, Daud, & Paino, 2015).

In addition, the study includes the consideration that the effects of the certification are significantly different depending on the type of hotel. In this respect, almost all the studies have affirmed that the relation between financial performance and environmental management depends on the size of hotels, the star category and their location. For this reason, one continuous and two dichotomous control variables have been introduced to include, respectively, size, star category and location of the hotels in the study. In accordance with the hypotheses defined, in order to differentiate the effects of certified and non-certified hotels on financial performance before and during the period of the crisis, two dummy control variables were introduced.

Table 8. Certified Hotels. Descriptive statistics.

Variables	Ratio	Mean	Non-Crisis Median	Std. dev.	Mean	Crisis Median	Std. dev.	
Large Size	Yes	ROA (%)	5.09%	5.57%	3.40%	4.88%	3.15%	3.67%
		RG (%)	3.20%	4.27%	6.81%	0.87%	2.70%	4.02%
		NOIPE	9,146.05	14,579.65	8,378.29	12,868.80	11,413.99	6,739.67
		AT	0.28	0.37	0.16	0.30	0.21	0.16
	No	ROA (%)	4.05%	4.72%	3.87%	3.36%	3.95%	4.77%
		RG (%)	2.55%	2.41%	3.85%	0.52%	0.45%	4.72%
		NOIPE	8,020.01	7,151.68	8,071.19	7,529.20	7,815.94	9,117.66
		AT	0.42	0.37	0.19	0.47	0.44	0.26
4-5 Stars	Yes	ROA (%)	3.82%	4.71%	3.69%	3.55%	3.19%	4.53%
		RG (%)	2.38%	2.41%	4.02%	0.39%	-0.02%	4.72%
		NOIPE	7,942.46	7,676.03	7,356.97	7,582.26	8,869.98	8,459.52
		AT	0.41	0.37	0.19	0.46	0.39	0.26
	No	ROA (%)	8.60%	9.02%	1.89%	3.49%	4.69%	7.06%
		RG (%)	5.83%	3.85%	6.21%	2.69%	3.40%	1.65%
		NOIPE	17,823.77	24,442.37	15,118.78	15,756.44	23,277.86	13,835.48
		AT	0.34	0.40	0.00	0.30	0.30	0.00
Beach	Yes	ROA (%)	4.16%	5.10%	4.03%	3.64%	4.67%	4.25%
		RG (%)	2.97%	2.91%	4.40%	1.03%	0.80%	4.62%
		NOIPE	8,934.38	8,228.77	8,530.36	9,118.28	9,350.21	9,056.25
		AT	0.39	0.37	0.19	0.42	0.41	0.21
	No	ROA (%)	4.31%	4.72%	1.44%	2.99%	1.71%	6.99%
		RG (%)	0.66%	0.45%	2.12%	-2.21%	-1.45%	3.58%
		NOIPE	7,096.92	5,491.44	6,926.66	2,709.21	2,443.17	6,596.25
		AT	0.48	0.40	0.21	0.61	0.37	0.46
Pooled Sample	ROA (%)	4.27%	4.73%	4.44%	3.77%	3.59%	4.95%	
	RG (%)	2.61%	2.70%	8.74%	0.37%	1.43%	9.98%	
	NOIPE	8,288.44	7,816.84	9,412.30	8,166.92	9,056.39	10,218.74	
	AT	0.40	0.40	0.21	0.43	0.39	0.25	

Where for hotel *i* at year *t*: $ROA_{i,t} = \text{Earnings before interest and taxes}_{i,t} / \text{Total assets}_{i,t}$, $RG = (\text{Revenues}_{i,t} - \text{Revenues}_{i,t-1}) / \text{Revenues}_{i,t-1}$, $NOIPE_{i,t} = \text{Net operating income}_{i,t} / \text{Number of employees}_{i,t}$, $AT_{i,t} = \text{Revenues}_{i,t} / \text{Total assets}_{i,t}$.

As shown in Table 7, the segmentation of the hotels into size, star category and location, made it possible to present the number of certified and non-certified hotels and the number of observations for each group. It should be noted that to group hotels by size in Table 7, the variable SIZE, defined as a continuous variable in Table 6, had to be defined dichotomously, differentiated as Yes = 1 if the hotel is large size, No = 0 otherwise. In line with Segarra-Oña et al. (2012), the European Commission Regulation 651/2014 has been taken into account to determine size. A European company is considered large if it has more than 250 workers, or if, on not having this number of workers, it has a business figure of over 50 million euros or assets of more than 43 million euros.

Results

Descriptive statistics and univariate analysis

The ratios corresponding to each group of hotels were calculated from the information contained in the hotel financial statements. Tables 8 and 9 show the mean, median and standard deviation values respectively, calculated for certified and non-certified hotels for the non-crisis and crisis periods. To determine whether the differences between the results obtained are significant, Table 10 presents the values corresponding to the differences in hotel ratios for each group and the t-Student test results.

Table 8 shows that in the crisis period only ROA and RG values worsen for all certified hotels as well as for the different segmentations made. However, unlike the non-certified hotels,

Table 9. Non-Certified Hotels. Descriptive statistics.

Variables		Ratio	Mean	Non-Crisis Median	Std. dev.	Mean	Crisis Median	Std. dev.
Large Size	Yes	ROA (%)	3.44%	3.24%	5.00%	1.35%	1.45%	4.01%
		RG (%)	1.25%	1.52%	7.96%	-1.48%	1.59%	10.06%
		NOIPE	6,415.62	7,348.05	8,306.21	1,276.60	1,468.05	7,541.73
		AT	0.41	0.30	0.27	0.40	0.29	0.27
	No	ROA (%)	5.02%	4.26%	5.43%	1.51%	1.90%	4.70%
		RG (%)	2.80%	3.24%	9.03%	-1.92%	-1.30%	12.00%
		NOIPE	5,782.20	4,325.09	6,511.47	2,352.87	2,220.63	7,415.21
		AT	0.60	0.54	0.34	0.53	0.45	0.32
4-5 Stars	Yes	ROA (%)	5.13%	4.45%	5.60%	1.90%	2.22%	4.75%
		RG (%)	2.50%	2.54%	8.92%	-0.63%	0.50%	11.51%
		NOIPE	6,859.37	5,951.21	7,504.87	3,789.33	3,832.31	8,060.10
		AT	0.58	0.51	0.33	0.49	0.43	0.30
	No	ROA (%)	4.87%	4.04%	5.30%	1.21%	1.60%	4.62%
		RG (%)	2.91%	3.55%	9.08%	-2.81%	-2.45%	12.21%
		NOIPE	4,163.35	3,476.76	5,512.96	1,306.96	1,375.14	6,751.44
		AT	0.62	0.56	0.35	0.55	0.48	0.33
Beach	Yes	ROA (%)	5.16%	4.46%	5.85%	2.52%	2.80%	4.76%
		RG (%)	2.44%	2.67%	9.13%	-0.05%	1.32%	11.65%
		NOIPE	5,350.59	4,711.52	7,037.80	4,006.96	3,632.03	7,884.84
		AT	0.58	0.51	0.35	0.50	0.43	0.30
	No	ROA (%)	4.73%	3.99%	4.78%	0.12%	0.68%	4.21%
		RG (%)	3.14%	3.61%	8.85%	-4.50%	-4.34%	11.92%
		NOIPE	5,205.71	4,226.01	5,820.38	22.55	641.13	6,004.22
		AT	0.63	0.59	0.33	0.56	0.49	0.35
Pooled Sample	ROA (%)	4.98%	4.19%	5.43%	1.50%	1.85%	4.68%	
	RG (%)	2.74%	3.15%	9.01%	-1.88%	-1.21%	11.96%	
	NOIPE	5,290.04	4,394.00	6,553.68	2,328.64	2,197.32	7,415.69	
	AT	0.60	0.53	0.34	0.53	0.45	0.32	

Where for hotel i at year t : $ROA_{i,t}$ = Earnings before interest and taxes $_{i,t}$ /Total assets $_{i,t}$. $RG = (Revenues_{i,t} - Revenues_{i,t-1}) / Revenues_{i,t-1}$. $NOIPE_{i,t}$ = Net operating income $_{i,t}$ /Number of employees $_{i,t}$. $AT_{i,t}$ = $Revenues_{i,t} / Total\ assets_{i,t}$.

column A of Table 10 reveals that these differences are statistically significant for RG of the whole sample, -2.24%, and for small certified hotels, -2.04%. Differences are also significant for ROA, -1.32%, and NOIPE, -4,387.70€, of hotels not situated on the coast.

As shown in Table 9, in the crisis period there is a general decrease in the mean value of all the ratios for all non-certified hotels and for each of the segmentations considered. Besides, in column B of Table 10, with the exception of RG and AT for large hotels, the t-student test indicates that these differences are statistically significant. In this respect, the hotels that are not situated on the coast are those that suffered the effects of the crisis more severely. These are the hotels where the drop in ROA, RG and NOIPE is more marked, -4.61%, -7.64% and -5,183.16€. By contrast, the smallest decreases are for ROA of large hotels, -2.10%, and RG and NOIPE of hotels situated on the coast, -2.50% and -1,343.62€.

In a comparison of the average values obtained in Tables 8 and 9 by the certified hotels and the non-certified hotels, the results of the t-student test in column D of Table 10 show how during the crisis period certified hotels, except for AT, obtain better values for all groups and ratios. Although the performance of certified hotels in the period prior to the crisis can also be qualified as better, the results are not as conclusive as those for the crisis period. In the period prior to the crisis, the certified hotels obtain lower values for AT. If we focus on column C of Table 10, the highest difference corresponds to 1-3 star hotels, -0.28. This situation persists during the crisis, and although with minor differences, it is again the 1-3 star hotels where the difference is greater, -0.25. In the period prior to the crisis, it is for the hotels not located on the coast where the least negative difference of -0.15 is obtained. In the crisis period, the least negative difference is for 4-5 star hotels, -0.03. If we look at NOIPE, for both periods, certified

Table 10. Mean Differences. T-Student test.

Variables	Ratio	Non Crisis vs Crisis		Certified vs non-Certified Hotels		
		Certified Column A	Non-Certified Column B	Non-Crisis Column C	Crisis Column D	
Large Size	Yes	ROA (%)	-0,21%	-2,10%*	1,65%	3,53%**
		RG (%)	-2,33%	-2,74%	1,95%*	2,36%
		NOIPE	3.722,75	-5.139,03**	2.730,43*	11.592,20**
	No	AT	0,03	-0,01	-0,13	-0,09
		ROA (%)	-0,69%	-3,51%**	-0,97%*	1,85%**
		RG (%)	-2,04%*	-4,72%**	-0,25%	2,43%**
4-5 Stars	Yes	NOIPE	-490,82	-3.429,33**	2.237,82**	5.176,33**
		AT	0,05	-0,08**	-0,19**	-0,06**
		ROA (%)	-0,27%	-3,24%**	-1,31%**	1,65%**
	No	RG (%)	-1,99%	-3,13%**	-0,12%	1,03%
		NOIPE	-360,21	-3.070,03**	1.083,10	3.792,92**
		AT	0,05	-0,08**	-0,17**	-0,03*
Beach	Yes	ROA (%)	-5,11%	-3,66%**	3,73%**	2,28%**
		RG (%)	-3,14%	-5,72%**	2,92%	5,50%**
		NOIPE	-2.067,33	-2.856,39**	13.660,42**	14.449,49**
	No	AT	0,03	-0,07**	-0,28**	-0,25**
		ROA (%)	-0,52%	-2,64%**	-1,00%*	1,12%**
		RG (%)	-1,93%	-2,50%**	0,53%	1,09%
Pooled Sample	Yes	NOIPE	183,89	-1.343,62**	3.583,80**	5.111,32**
		AT	0,03	-0,08**	-0,19**	-0,08**
		ROA (%)	-1,32%*	-4,61%**	-0,42%	2,87%*
	No	RG (%)	-2,87%	-7,64%**	-2,47%	2,29%
		NOIPE	-4.387,70**	-5.183,16**	1.891,21	2.686,66*
		AT	0,14	-0,07**	-0,15*	0,06
Pooled Sample	ROA (%)	-0,50%	-3,48%**	-0,71%	2,27%**	
	RG (%)	-2,24%*	-4,62%**	-0,13%	2,25%**	
	NOIPE	-121,52	-2.961,40**	2.998,40**	5.838,28**	
	AT	0,02	-0,08**	-0,19**	-0,09**	

* $p < 0.05$; ** $p < 0.01$.

hotels obtained higher values than non-certified hotels. Their maximum values for the period prior to and during the crisis reach, respectively, 13,660.42€ and 14,449.49€, for 1–3 star hotels. In reference to ROA and RG, during the crisis period, certified hotels obtained higher values than non-certified hotels. The t-student shows the most significant differences in ROA and RG can be found in large hotels with 3.53%, and 1–3 star hotels with 5.50% respectively; while, minor differences can be found in hotels located on the coast with 1.12%, and no large hotels with 2.43%. In the period prior to the crisis, however, there is a greater disparity in the results. It is the 1–3 star hotels where the positive differences in ROA are greater, 3.73%. Instead, the strongest negative differences in ROA can be found in 4–5 star hotels, -1.31%. However, statistically significant differences in RG are only obtained for large hotels, 1.95%.

Multivariate analysis

To contrast the proposed hypotheses, a multivariate analysis was carried out. In line with García Rodríguez and Armas Cruz (2007), Carmona-Moreno et al. (2004), the effect of the defined independent variables on the dependent variable ROA is determined through a multiple linear regression technique taking into consideration their interrelations. In hypotheses H1 and H2, the objective is to verify if ROA decreased in the period of the 2008 financial crisis with respect to the period prior to it. In line with Alonso-Almeida et al. (2016), Segarra-Oña et al. (2012), to do so, we introduced CRISIS as a dummy variable and added its interaction with the independent variables. To include the characteristics of the hotels in the study, we also

introduced BEACH and STARS as dummy variables, and SIZE as continuous. The equation defined for H1 is the following:

$$ROA_{it} = \alpha_0 + \beta_1 RG_{it} + \beta_2 NOIPE_{it} + \beta_3 AT_{it} + \beta_4 CRISIS + \beta_5 CRISIS * RG_{it} + \beta_6 CRISIS * NOIPE_{it} + \beta_7 CRISIS * AT_{it} + \beta_8 BEACH_{it} + \beta_9 SIZE + \beta_{10} STARS_{it} + e_{it}$$

As the objective of H1 is to verify these relations for certified hotels, in order to accept or reject this hypothesis, data from certified hotels for the periods prior to and during the crisis were used. In the same way, to analyze this for non-certified hotels and to accept or reject H2, data from non-certified hotels were used for both periods.

For hypotheses H3 and H4, as the objective is to find out whether ROA was higher in certified hotels than in non-certified hotels, we defined CERT as a dummy variable. Likewise, its interaction with the independent variables was introduced. The regression models defined for the third hypothesis are as follows:

$$ROA_{it} = \alpha_0 + \beta_1 RG_{it} + \beta_2 NOIPE_{it} + \beta_3 AT_{it} + \beta_4 CERT + \beta_5 CERT * RG_{it} + \beta_6 CERT * NOIPE_{it} + \beta_7 CERT * AT_{it} + \beta_8 BEACH_{it} + \beta_9 SIZE_{it} + \beta_{10} STARS_{it} + e_{it}$$

As the objective of H3 is to find out whether ROA was higher in certified hotels than in non-certified hotels in the recession period, data from the certified and non-certified hotels in the crisis period were used. As H4 will contrast the same hypothesis but in the period prior to the crisis, values from certified and non-certified hotels in the period prior to the crisis were used.

Given that the sample under study comprises a heterogeneous group of hotels for the period prior to and during the crisis period, a contrast of the equations proposed in the hypotheses was carried out using a linear regression analysis with panel data. In the panel data model, two approaches (fixed effects and random effects) are considered according to the behavior of individual and temporal effects α_i . The Hausman test was applied to decide which of the approaches best fitted the behavior of the sample. The results of the test revealed the absence of random effects in the analyzed model, concluding that the model indicated was fixed effects. Following the extant literature (King & Lenox, 2002; Wagner, 2010), we also used a fixed effects model for our study. For the effects of unobservable heterogeneity corresponding to the specific characteristics of each hotel and period, a dummy variable α_i was introduced for hotel and year.

As the Pearson correlation coefficients (untabulated) between variables do not exceed the rule of thumb level (0.80), and the Variance Inflation Factors (VIF) and condition indices (untabulated) for the independent variables are less than 4 and 2 respectively, we can assert that multicollinearity is unlikely to be an issue of concern (Menard, 2002; Pedhazur, 1997; Kleinbaum, Kupper, Muller, & Nizam, 1998). Table 11 shows the results of the multivariate regression for the analysis of the association between ROA and the independent variables RG, NOIPE, AT, their interactions with CERT and CRISIS, and the dichotomous variables BEACH and STARS. Each column shows the results obtained in the regressions corresponding to hypotheses H1, H2, H3 and H4.

As can be observed in column A of Table 11, for certified hotels, the estimated coefficients for AT and NOIPE are positive and statistically significant, 0.111 and 3.319E-6, indicating that in both periods AT and NOIPE have influenced ROA positively. As can be observed, neither the CRISIS variable nor its interaction with the independent variables appear in the model. This would indicate that in the financial crisis RG, NOIPE and AT did not affect ROA in certified hotels. So, H1 can be rejected. Although it is reasonable to believe that the crisis would have had negative effects, with respect to certified hotels its impact has been null. The results also reveal the variables SIZE, 0.015, and STARS, 0.012, have a positive influence on ROA. The larger the hotel and the higher the number of stars, the greater the effect is on its financial performance.

Column B of Table 11 shows the results obtained to contrast H2. Therefore, it could be affirmed that not being certified has aggravated the effects of the crisis on the hotels. As can be observed in column B, for non-certified hotels, although RG, NOIPE and AT had a positive effect on ROA in the period prior to the financial crisis, it is important to highlight that during the crisis

Table 11. Multivariate Regression Results.

Variables	Non Crisis vs Crisis		Variables	Certified vs non-Certified Hotels	
	Certified Column A	Non-Certified Column B		Crisis Column C	Non-Crisis Column D
Intercept	-0.072 (-10.789)*	-0.030 (-12.894)*	Intercept	-0.029 (-12.587)*	-0.040 (-11.341)*
RG		0.050 (5.711)*	RG	0.014 (2.677)*	0.050 (6.468)*
NOIPE	3.319E-6 (26.516)*	5.807E-6 (40.716)*	NOIPE	5.193E-6 (42.113)*	5.454E-6 (36.559)*
AT	0.111 (25.745)*	0.083 (27.865)*	AT	0.062 (17.226)*	0.087 (29.403)*
RGxCRISIS		-0.030 (-2.634)*	RGxCERT		
NOIPExCRISIS		-5.610E-7 (-3.277)*	NOIPExCERT	-1.987E-6 (-8.848)*	-1.599E-6 (-6.407)*
ATxCRISIS		-0.047 (-13.377)*	ATxCERT	0.074 (11.452)*	0.019 (3.381)*
SIZE	0.015 (6.234)*		SIZE		0.008 (4.332)*
STARS	0.012 (2.827)*				
Fixed effect variables	included	included	included	included	included
N	492	2,040	1,266	1,266	1,266
Adj. R2	0.866	0.832	0.878	0.878	0.834

Corrected t-statistics are in parentheses. *Significance at the 1% level based on two-sided tests.

Where for hotel *i* at year *t*: $ROA_{i,t}$ = Earnings before interest and taxes_{*i,t*}/Total assets_{*i,t*}. $RG = (Revenues_{i,t} - Revenues_{i,t-1}) / Revenues_{i,t-1}$. $NOIPE_{i,t}$ = Net operating income_{*i,t*}/Number of employees_{*i,t*}. $AT_{i,t}$ = Revenues_{*i,t*}/Total assets_{*i,t*}.

period these variables worsened. Prior to the crisis RG, NOIPE and AT are 0.050, 5.807E-6 and 0.083 respectively. Meanwhile, during the crisis, the appearance of the interactions RG*CRISIS, -0.030, NOIPE*CRISIS, -5.0610E-7 and AT*CRISIS, -0.047, decrease their positive effect on ROA. In this way, in the crisis period the effect of RG, NOIPE and AT on ROA is 0.050-0.030 = 0.020, 5.807E-6-5.610E-7 = 5.25E-6, and 0.083-0.047 = 0.036 respectively. Consequently, these differences have led us to accept H2, and it is possible to affirm that the relation between the financial performance of hotels without the certificate and the independent variables worsened due to the financial crisis.

Columns C and D of Table 11 give the results for H3 and H4. The results of this contrast shows whether having the certificate had any influence on ROA in the periods during and prior to the crisis respectively. As can be observed from the results in the column C, the regression indicates that the variables RG, 0.014, NOIPE, 5.193E-6, and AT, 0.062, had an identically positive influence on ROA for both certified and non-certified hotels. However, the effect of NOIPE on ROA for certified hotels is lower, since it would be the sum of 5.193E-6-1.987E-6 = 3.206E-6. In contrast, the effect of AT on ROA for certified hotels is higher, 0.062 + 0.074 = 0.136. In conclusion, due to the different signs of the effects of NOIPE and AT on ROA during the crisis, it would not be possible to affirm that certified hotels had a higher ROA than non-certified hotels in the crisis period. Consequently, although the positive influence of AT on ROA is notably higher than the negative effect of NOIPE, H3 would be rejected.

Finally, column D shows the differences between certified and non-certified hotels in the period prior to the financial crisis. As can be observed, prior to the crisis period RG, 0.050, NOIPE, 5.454E-6, and AT, 0.087, had a positive influence on ROA for both groups of hotels. However, since there is a negative interaction NOIPE*CERT, -1.599E-6, it is lower for certified hotels, corresponding to 5.454E-6-1.599E-6 = 3.855E-6. In contrast, the positive interaction AT*CERT, 0.019, means that for certified hotels the effect of AT on ROA is higher 0.087 + 0.019 = 0.106. Besides, unlike the previous three regressions, the variable SIZE (0.008) appears, which would indicate that in the period prior to the crisis, the size of the hotel had a positive effect on ROA. Similar to

the crisis period, in view of the results obtained, it would not be possible to affirm that certified hotels had a higher ROA than non-certified hotels. Therefore, H4 would be rejected.

Discussion

The hotel sector has suffered the negative repercussions of the 2008 financial crisis. In this context, hotel managers found themselves in the difficult situation of deciding which direction their environmental actions should take. They had to decide whether to reduce or withdraw investments in environmental management because they considered them dispensable and unessential, or, on the contrary, continue to use environmental management tools. For this reason, the objective of this study is to analyze the relation between the financial performance of hotels and environmental management during the 2008 financial crisis. Consequently, the opportuneness and relevance of this study is justified. Furthermore, it contributes to and fills the gap in the literature that has approached the subject of the relations between the financial performance and environmental management of hotels in the recent 2008 financial crisis.

Certification is a widespread practice among hotels as a means of demonstrating their environmental commitment. Certification can lead to internal and external improvements in an organization, whereby they can gain competitive advantages that increase the hotels' financial performance. In this respect, on the one hand, certification could contribute to hotels achieving internal improvements that optimize assets management and workers' efficiency. And, on the other hand, it could also allow them to improve their external image, thereby generating an increase in sales.

In the context of the above considerations, the question is to determine whether, as foreseen, the expected negative effects of the crisis on financial performance were alleviated by environmental certification. To do so, an analysis has been made of whether the effect of assets management (AT), workers (NOIPE) and sales (RG) on the financial performance (ROA) of hotels during the 2008 financial crisis was different to the period prior to the crisis, according to whether the hotel was certified or not.

The results of the t-student test show that during the crisis period the values for ROA, RG, NOIPE and AT of non-certified hotels as a whole and of all groups have not worsened in comparison with the period prior to the crisis. While the impact of the crisis has been more adverse for the hotels not situated on the coast, it is the large hotels situated on the coast that have been less affected. The effects of the crisis on certified hotels as a whole as well for the different groups have been slight. The only statistically significant negative effects have been for RG of the pooled sample, ROA and NOIPE of hotels not situated on the coast and RG of small hotels.

If we focus on the crisis period, certified hotels as a whole have a better performance compared to non-certified hotels. Except for AT, for the rest of the ratios, the certified hotels obtain better values. However, in the period prior to the crisis the results are inconclusive. While certified hotels do obtain better values for NOIPE, AT is negative and ROA and RG do not show any statistically significant differences. In both periods, it is the large certified 1-3 star hotels that show a better performance compared to the non-certified hotels. With respect to the location of the hotels, the results are not so conclusive.

The multivariate study can be explained in similar terms. The results have revealed that while for certified hotels the effect of AT, NOIPE and RG on ROA did not vary, for non-certified hotels, the effect worsened in the crisis period. Therefore, it could be asserted that during the crisis period environmental certification favorably influenced assets management, workers' efficiency and sales. In this sense, far from decreasing their effect on financial performance, as would be expected, they remained the same as during the crisis period. In line with Gallego-Álvarez et al. (2014), the results obtained affirm that in periods of financial crisis, certification has enabled hotels to withstand the crisis better, since the adverse effects were less severe for them than for

the non-certified hotels. Also, the higher the category and size of the hotel the greater the influence on ROA.

It is evident that the certified hotels managed to maintain their competitive advantages, which allowed them to support the effects of the crisis better than the non-certified hotels. Nevertheless, this study has not led to conclusive evidence about whether the financial performance of certified hotels is higher than that of non-certified hotels in either the crisis period or the period prior to it. In this respect, the results indicate that while the effect of AT on ROA of certified hotels is positive, the effect of NOIPE is negative. In this respect, it should be highlighted that the positive effect of assets management far exceeds the negative effect of workers and of the constant on financial performance. Note that in the period prior to the crisis, 4-5 star hotels have a positive effect on ROA.

In summary, this study confirms prior investigation. It has shown that certification in times of crisis is favorably valued by clients as a credential of environmental concern in hotels, which also improves their services (Alonso-Almeida & Rodríguez-Antón, 2011) and increases their sales (Sharma et al., 2007). Additionally, the certificate is a tool that improves the internal and operational running of the organization (Chan, 2009), which leads certified hotels to make a more efficient use of assets in order to generate income. In line with the study by Dögl and Holtbrügge (2014), it also confirms that the practices associated to environmental certification lead to greater involvement and commitment by workers from certified hotels, thereby improving their performance.

Implications for theory, managerial and policy

The results of the study show that for non-certified hotels the influence of asset management, worker efficiency and sales on financial performance worsened during the period of economic recession compared with the period prior to the crisis. However, for certified hotels, far from decreasing, as would be expected, it remained the same for the crisis period. Therefore, it could be affirmed that during the crisis period, environmental certification has enabled certified hotels to withstand the crisis better. On the other hand, in neither period, before or during, has it been possible to verify that certified hotels obtain better results in comparison with non-certified hotels.

This research is relevant for managers, since it demonstrates that in times of financial crisis the effect of environmental certification on a company's external reputation and internal efficiency remains the same as in the period prior to the crisis. This scenario is completely the opposite to that of the non-certified hotels. Furthermore, being aware of the performance of hotels in relation to their size, location and stars provides hotel managers with important information. In this sense, generally speaking, large 4-5 star hotels situated on the coast obtain better results in both periods in certified as well as non-certified hotels.

In periods of financial crisis, the competitive advantages derived from environmental certification could be the key strengths of an organization that result from environmental strategies. These strengths are the intangible assets that managers should take advantage of (Segarra-Oña et al., 2012). In this regard, it is important to stress that the results obtained can attract investors and customers to certified hotels. In a highly competitive market, affected by the crisis, managers in the hotel sector should make the most of this situation to establish a close link with clients so as to develop loyalties based on environmental management (Sharma et al., 2007). If hotels engage in diffusing their environmental commitment, they can improve the quality perceived by their clients and improve their environmental image (Chan & Wong, 2006).

In this sense, it is also important to point out that not only will clients be influenced, but tourist intermediaries, who increasingly require hotels to have a more respectful attitude towards the environment (Claver-Cortés et al., 2010). On the other hand, investment in environmentally

certified hotels implies investing in organizations whose financial performance is less affected in times of crisis. In this sense, investors will perceive that hotels which do not meet the standards could find themselves in a worse situation in times of crisis (Albertini, 2013). On the other hand, these results show that in times of crisis, environmental certification can attract a type of investor and customer whose decisions are not just based on economic and financial aspects. They would be investors and clients sensitized to environmental management, who prefer to invest in and buy from hotels recognized by the implementation of environmental measures (Chan, 2013).

As argued by Muhammad et al. (2015), the usefulness of this study can be extended to public administrations and entities. They will gain knowledge about how the resources, policies, and actions carried out to promote environmental measures can act as a showcase for transmitting that environmental management is profitable. Especially, in periods of crisis, when it is more patent. In this respect, one initiative that politicians should undertake would be to provide hotels managers with training and information about environmental management. In this sense, governmental legislation should play an important role in supporting hotels in their aim to obtain environmental certification. According to Chan and Wong (2006), promoting these public incentives and financing studies that analyze their impact on organizations can initially be used to encourage companies without any awareness of environmental management to adopt environmental practices, which will have financial implications for them. On the basis of this initial approach, the gradual advances in awareness of this need will lead to environmental management becoming definitively established in companies. On the other hand, as stipulated in the regulations of the Spanish Public Administration, environmental certification is a mandatory requirement or will be positively valued as regards any contracts with, or financing and grants from the Public Administration.

The improved behavior of certified hotels in periods of economic recession is a relevant factor that will give them preference with suppliers. In this way, managers could use it to improve their relations and monitor suppliers more strictly (Zeng, Tian, & Shi, 2005). Besides, it is an opportunity to set suppliers an example, requiring them to have a greater environmental commitment in return (Gavrinski, Ferrer, & Paiva, 2008). Similarly, the job security and stability that workers perceive from certified hotels during recession periods will increase satisfaction, morale and motivation (Gavrinski et al., 2008).

Finally, this paper is of interest to researchers in that it is an in-depth analysis of the relation between financial performance and certification of measures for environmental management at times of crisis, which is a line of research that requires further investigation.

Conclusion

This study has revealed that certification permitted Spanish hotels to cope better with the crisis since the adverse effects were less severe than for the non-certified hotels. The results obtained can be used to show hotel managers that the impact of the financial crisis on financial performance is practically non-existent for certified hotels.

Therefore, withdrawing or limiting funds allocated to environmental management in crisis periods is counterproductive and senseless, which is evident from the fact that the certified hotels experienced fewer adverse effects from the financial crisis. Reducing and withdrawing resources allocated to environmental management in times of financial crisis would affect their competitiveness and ability to face adverse situations caused by economic crises. As a result, not only would it lead to a decrease in the hotels' financial performance, but it would also have a negative repercussion on the environmental performance of hotels, and in turn on the environment itself (Gallego-Álvarez et al., 2014).

Finally, the opportuneness and relevance of this study is justified, since it contributes to and fills the gap in the literature that has approached the subject of the relations between the financial performance and environmental management of hotels in the recent 2008 financial crisis. In this respect, although a large number of the studies conclude that adopting environmental management was positively related to financial performance (Molina-Azorín et al., 2009b), studies that analyze this relation in the period of the 2008 financial crisis are scarce and inconclusive. Thus, the main added value of this research is that it obtains evidence about the direction of this relation, especially in periods of financial recession. This, in turn, also provides managers with arguments that will be useful for determining the direction of their environmental decisions in difficult times.

Limitations and future research

Although hotels are one of the most important sectors in number of ISO 14001 and EMAS certificates and Spain is the first for EMAS certified hotels, the data available has been limited. This is due to the number of certified hotels that had to be eliminated because the information included in the financial statements was not reliable. Another factor that has conditioned this study is that it has focused on individual hotels with an independent legal status and independent management. It would have been more desirable to have a greater number of hotels, especially certified hotels that were large, with 1-3 stars and situated on the coast. However, as already indicated, it is in fact these types of hotels where there is less likelihood of certification.

One limitation of the study is the assumption that the hotels with environmental certification are environmentally proactive and that those that are not certified do not have a proactive attitude. This implies acknowledging homogeneity in the environmental behavior of the groups of certified hotels and non-certified hotels. However, as asserted by Aravind and Christmann (2011), Iatridis and Kesidou (2018), Testa, Boiral, and Iraldo (2018), Martín-de Castro, Amores-Salvadó, Navas-López, and Balarezo-Nuñez (2017) this does not necessarily have to be the case. The purpose of obtaining certification could be to seek legitimation externally, but without necessarily having a real environmental commitment. Conversely, not having the certification does not imply that the hotel has not adopted measures to reduce environmental impacts. In this sense and to avoid any bias that this could generate in the results, in future research, it would be interesting to introduce a symbolic adoption of environmental certification and the corresponding measures.

Additionally, it would be very interesting to complement this quantitative analysis with a qualitative study, which would involve interviews with hotels managers. Through a survey the hotels managers could give their opinion about why the certified hotels were less adversely affected by the crisis, the main reasons from their point of view, and why they consider that financial performance of certified hotels was not higher than for non-certified hotels in either of the periods.

In summary, this paper is of interest to researchers in that it provides a basis for being able to broaden the perspectives from which this issue can be approached, such as comparison with other sectors of activity, countries, internationalization and previous financial crises.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

José Antonio Cavero-Rubio is PhD Associate Professor in Financial Economics and Accounting at Miguel Hernandez University of Elche. He is the director of the Economic and Financial Studies Department at this university. His research focuses on sustainable tourism development, hotels environmental certification and financial performance, agricultural industry and how they are intertwined with environmental certification, gender equality, transparency of public sector organisations and political parties financing. He has made contributions in these areas and has

published in *Journal of Construction Engineering and Management*, *Innovations in Education and Teaching International*, *Australian Accounting Review*, *Agricultural Economic Technical Information* and *Women's Studies International Forum*.

Araceli Amorós-Martínez is PhD Professor in Financial Economics and Accounting at Miguel Hernandez University of Elche. Her current research focuses on hotels environmental certification and financial performance, agricultural industry and environmental certification, goodwill impairment, and financial situation of political parties and financing laws with a comparative approach. She has made contributions in these areas and has published in *Australian Accounting Review*, *Agricultural Economic Technical Information* and *Women's Studies International Forum*.

References

- Albertini, E. (2013). Does environmental management improve financial performance? A meta-analytical review. *Organization & Environment*, 26(4), 431–457. doi:10.1177/1086026613510301
- Alonso-Almeida, M. D. M., & Bremser, K. (2013). Strategic responses of the Spanish hospitality sector to the financial crisis. *International Journal of Hospitality Management*, 32, 141–148. doi:10.1016/j.ijhm.2012.05.004
- Alonso-Almeida, M. D. M., & Rodríguez-Antón, J. M. (2011). Organisational behaviour and strategies in the adoption of certified management systems: An analysis of the Spanish hotel industry. *Journal of Cleaner Production*, 19(13), 1455–1463. doi:10.1016/j.jclepro.2011.04.015
- Alonso-Almeida, M. D. M., Llach, J., Barquero, J. D., & Bremser, K. (2016). Workforce and destination influence over hospitality industry performance. *EuroMed Journal of Business*, 11(3), 395–409. doi:10.1108/EMJB-04-2016-0014
- Álvarez Gil, M. A., Burgos Jiménez, J. B., & Céspedes Lorente, J. C. (2001). An analysis of environmental management, organizational context and performance of Spanish hotels. *Omega*, 29(6), 457–471. doi:10.1016/S0305-0483(01)00033-0
- Ambec, S., & Lanoie, P. (2008). Does it pay to be green? A systematic overview. *Academy of Management Perspectives*, 22(4), 45–62.
- Aragón-Correa, J. A., & Sharma, S. (2003). A contingent resource-based view of proactive corporate environmental strategy. *The Academy of Management Review*, 28(1), 71–88. doi:10.2307/30040690
- Aravind, D., & Christmann, P. (2011). Decoupling of standard implementation from certification: Does quality of ISO 14001 implementation affect facilities' environmental performance? *Business Ethics Quarterly*, 21(1), 73–102. doi:10.5840/beq20112114
- Bonilla Priego, M. J., & Avilés Palacios, C. (2008). Analysis of environmental statements issued by EMAS-certified Spanish hotels. *Cornell Hospitality Quarterly*, 49(4), 381–394. doi:10.1177/0010880407307766
- Bonilla Priego, M. J., Najera, J. J., & Font, X. (2011). Environmental management decision-making in certified hotels. *Journal of Sustainable Tourism*, (3), 361–381. doi:10.1080/09669582.2010.530350
- Bureau Van Dijk. (2016). Data from: *Iberian Balance Sheet Analysis System (SABI)*. Retrieved from <https://www.bvdinfo.com/en-gb>.
- Campos-Soria, J. A., Inchausti-Sintes, F., & Eugenio-Martin, J. L. (2015). Understanding tourists' economizing strategies during the global economic crisis. *Tourism Management*, 48, 164–173. doi:10.1016/j.tourman.2014.10.019
- Carmona-Moreno, E., Céspedes-Lorente, J., & De Burgos-Jiménez, J. (2004). Environmental strategies in Spanish hotels: Contextual factors and performance. *The Service Industries Journal*, 24(3), 101–130. doi:10.1080/0264206042000247786
- Cavero-Rubio, J. A., & Amorós-Martínez, A. (2017). Eco-Management and Audit Scheme (EMAS) environmental certification and its impact on agricultural companies' financial performance. *Información Técnica Económica Agraria*, 113(3), 287–305.
- Chan, E. S. W. (2013). Gap analysis of green hotel marketing. *International Journal of Contemporary Hospitality Management*, 25(7), 1017–1048.
- Chan, E. S., & Wong, S. C. (2006). Motivations for ISO 14001 in the hotel industry. *Tourism Management*, 27(3), 481–492. doi:10.1016/j.tourman.2004.10.007
- Chan, W. W. (2009). Environmental measures for hotels' environmental management systems: ISO 14001. *International Journal of Contemporary Hospitality Management*, 21(5), 542–560. doi:10.1108/09596110910967791
- Chan, W. W., & Ho, K. (2006). Hotels' environmental management systems (ISO 14001): Creative financing strategy. *International Journal of Contemporary Hospitality Management*, 18(4), 302–316. doi:10.1108/09596110610665311
- Chong, H., & Verma, R. (2013). Hotel sustainability: Financial analysis shines a cautious green light. *Cornell Hospitality Report*, 13(10), 4–13.
- Claver-Cortés, E., Molina-Azorín, J. F., Pereira-Moliner, J., & López-Gamero, M. D. (2007). Environmental strategies and their impact on hotel performance. *Journal of Sustainable Tourism*, 15(6), 663–679. doi:10.2167/jost640.0
- Claver-Cortés, E., Pereira-Moliner, J., Molina-Azorín, J. F., & Tari-Guilló, J. J. (2010). Certificación en calidad y medio ambiente y su relación con el rendimiento empresarial: Evidencia en el sector hotelero español. *Papers de Turisme*, 47–48, 24–37.

- Combs, J. G., Ketchen, D. J., Jr., Crook, T. R., & Roth, P. L. (2011). Assessing cumulative evidence within 'macro' research: Why meta-analysis should be preferred over vote counting. *Journal of Management Studies*, 48(1), 178–197. doi:10.1111/j.1467-6486.2009.00899.x
- Corbett, C. J., Montes-Sancho, M. J., & Kirsch, D. A. (2005). The financial impact of ISO 9000 certification in the United States: An empirical analysis. *Management Science*, 51(7), 1046–1059. doi:10.1287/mnsc.1040.0358
- Cordero, J. M., & Tzeremes, N. G. (2017). Evaluating hotel productivity growth in Balearic and Canary islands. *Tourism Economics*, 23(5), 1146–1154. doi:10.1177/1354816616683051
- Cordero, J. M., & Tzeremes, N. G. (2018). Financial crisis and hotels' labour productivity growth: Evidence from Spanish islands. *Applied Economics Letters*, 25(19), 1376–1382. doi:10.1080/13504851.2017.1420884
- De Jong, P., Paulraj, A., & Blome, C. J. (2014). The financial impact of ISO 14001 certification: Top-line, bottom-line, or both? *Journal of Business Ethics*, 119(1), 131–149. doi:10.1007/s10551-012-1604-z
- Deng, Y., Veiga, H., & Wiper, M. P. (2019). Efficiency evaluation of hotel chains: A Spanish case study. *SERIEs*, 10(2), 115–139. doi:10.1007/s13209-019-0188-6
- Dixon-Fowler, H. R., Slater, D. J., Johnson, J. L., Ellstrand, A. E., & Romi, A. M. (2013). Beyond "Does it pay to be green?" A meta-analysis of moderators of the CEP-CFP relationship. *Journal of Business Ethics*, 112(2), 353–366. doi:10.1007/s10551-012-1268-8
- Dögl, C., & Holtbrügge, D. (2014). Corporate environmental responsibility, employer reputation and employee commitment: An empirical study in developed and emerging economies. *The International Journal of Human Resource Management*, 25(12), 1739–1762. doi:10.1080/09585192.2013.859164
- Endrikat, J., Guenther, E., & Hoppe, H. (2014). Making sense of conflicting empirical findings: A meta-analytic review of the relationship between corporate environmental and financial performance. *European Management Journal*, 32(5), 735–751. doi:10.1016/j.emj.2013.12.004
- European Commission. (2016). Data from: Statistics and graphs. Retrieved from <http://ec.europa.eu/environment/emas/register/>.
- EXCELTUR. (2019). Índice sintético del PIB turístico español. Retrieved from <https://www.exceltur.org/indice-sintetico-del-pib-turistico-espanol-iste-2/>.
- Fernández-Feijóo Souto, B. (2009). Crisis and corporate social responsibility: Threat or opportunity? *International Journal of Economic Sciences and Applied Research*, 2(1), 36–50.
- Ferron, R. T., Funchal, B., Nossa, V., & Teixeira, A. J. C. (2012). Is ISO 14001 certification effective? An experimental analysis of firm profitability. *Bar - Brazilian Administration Review*, 9(spe), 78–94. doi:10.1590/S1807-76922012000500006
- Gallego-Álvarez, I., García-Sánchez, I. M., & da Sil Vieira, C. (2014). Climate change and financial performance in times of crisis. *Business Strategy and the Environment*, 23(6), 361–374. doi:10.1002/bse.1786
- García Rodríguez, F. J., & Armas Cruz, Y. M. (2007). Relation between social-environmental responsibility and performance in hotel firms. *International Journal of Hospitality Management*, 26(4), 824–839. doi:10.1016/j.ijhm.2006.08.003
- García-Pozo, A., Sánchez-Ollero, J. L., & Ons-Cappa, M. (2016). ECO-innovation and economic crisis: A comparative analysis of environmental good practices and labour productivity in the Spanish hotel industry. *Journal of Cleaner Production*, 138, 131–138. doi:10.1016/j.jclepro.2016.01.011
- Gavronski, I., Ferrer, G., & Paiva, E. (2008). ISO 14001 certification in Brazil: Motivations and benefits. *Journal of Cleaner Production*, 16(1), 87–94. doi:10.1016/j.jclepro.2006.11.002
- Geerts, W. (2014). Environmental certification schemes: Hotel managers' views and perceptions. *International Journal of Hospitality Management*, 39(1), 87–96. doi:10.1016/j.ijhm.2014.02.007
- González-Rodríguez, M. D. R., Martín-Samper, R., & Giuliani, A. C. (2015). Evaluating the efficiency progress with technology in a Spanish hotel chain. *Revista de Administração de Empresas*, 55(5), 551–562. doi:10.1590/S0034-759020150507
- Hazudin, S. F., Mohamad, S. A., Azer, I., Daud, R., & Paino, H. (2015). ISO 14001 and financial performance: Is the accreditation financially worth it for Malaysian firms. *Procedia Economics and Finance*, 31, 56–61. doi:10.1016/S2212-5671(15)01131-4
- Heras-Saizarbitoria, I., Molina-Azorín, J. F., & Dick, G. P. (2011). ISO 14001 certification and financial performance: Selection-effect versus treatment-effect. *Journal of Cleaner Production*, 19(1), 1–12. doi:10.1016/j.jclepro.2010.09.002
- Hoffman, A. J., & Bansal, P. (2012). Retrospective, perspective, and prospective: Introduction to the Oxford handbook on business and the natural environment. In P. Bansal & A. J. Hoffman (Eds.), *The Oxford handbook on business and the natural environment* (pp. 3–25). Oxford: University Press.
- Horváthová, E. (2010). Does environmental performance affect financial performance? A meta-analysis. *Ecological Economics*, 70(1), 52–59. doi:10.1016/j.ecolecon.2010.04.004
- Iatridis, K., & Kesidou, E. (2018). What drives substantive versus symbolic implementation of ISO 14001 in a time of economic crisis? Insights from Greek manufacturing companies. *Journal of Business Ethics*, 148(4), 859–877. doi:10.1007/s10551-016-3019-8
- International Organization for Standardization [ISO]. (2017). ISO Survey 2017. Retrieved from <https://isotc.iso.org/livelink/livelink?func=ll&objId=18808772&objAction=browse&viewType=1>.
- Juvan, E., & Dolnicar, S. (2017). Drivers of pro-environmental tourist behaviors are not universal. *Journal of Cleaner Production*, 166(10), 879–890. doi:10.1016/j.jclepro.2017.08.087

- Kallio, T. J., & Nordberg, P. (2006). The evolution of organizations and natural environment discourse: Some critical remarks. *Organization & Environment*, 19(4), 439–457.
- Karaibrahimoğlu, Y. Z. (2010). Corporate social responsibility in times of financial crisis. *African Journal of Business Management*, 4(4), 382–389.
- Kassinis, G., & Soteriou, A. (2005). Greening service organizations: Environmental management practices and performance. In S. Sharma & J. A. Aragón-Correa (Eds.), *Corporate environmental strategy and competitive advantage* (pp. 115–138). Northampton: Edward Elgar Publishing.
- Kimes, S.E. (2009). Hotel revenue management in an economic downturn: Results of an International Study. *Cornell Hospitality Report*, 9(12), 6–17.
- King, A., & Lenox, M. (2002). Exploring the locus of profitable pollution reduction. *Management Science*, 48(2), 289–299.
- Kleinbaum, D. G., Kupper, L. L., Muller, K. E., & Nizam, A. (1998). *Applied regression analysis and other multivariable methods*. Belmont, CA: Thomson Brooks/Cole Publishing Co.
- Koe Hwee Nga, J. (2009). The influence of ISO 14000 on firm performance. *Social Responsibility Journal*, 5(3), 408–422. doi:10.1108/17471110910977311
- Lado-Sestayo, R., Otero-González, L., Vivel-Búa, M., & Martorell-Cunill, O. (2016). Impact of location on profitability in the Spanish hotel sector. *Tourism Management*, 52, 405–415.
- Leonidou, L. C., Leonidou, C. N., Fotiadis, T. A., & Zeriti, A. (2013). Resources and capabilities as drivers of hotel environmental marketing strategy: Implications for competitive advantage and performance. *Tourism Management*, 35, 94–110.
- Li, S. Na., Blake, A., & Cooper, C. (2010). China's tourism in a global financial crisis: A computable general equilibrium approach. *Current Issues in Tourism*, 13(5), 435–453.
- López-Gamero, M. D., Molina-Azorín, J. F., & Claver-Cortés, E. (2011). The relationship between managers' environmental perceptions, environmental management and firm performance in Spanish hotels: A whole framework. *International Journal of Tourism Research*, 13(2), 141–163.
- Martín-de Castro, G., Amores-Salvadó, J., Navas-López, J. E., & Balarezo-Nuñez, R.M. (2017). Exploring the nature, antecedents and consequences of symbolic corporate environmental certification. *Journal of Cleaner Production*, 164(15), 664–675.
- Menard, S. (2002). *Applied logistic regression analysis. Series: Quantitative applications in the social sciences*. London: Sage Publications.
- Miras, M. M., Escobar, B., & Carrasco, A. (2014). Are Spanish listed firms betting on CSR during the crisis? Evidence from the agency problem. *Business and Management Research*, 3(1), 85–95.
- Molina-Azorín, J. F., Claver-Cortés, E., López-Gamero, M. D., & Tarí, J. J. (2009a). Green management and financial performance: A literature review. *Management Decision*, 47(7), 1080–1100. doi:10.1108/00251740910978313
- Molina-Azorín, J. F., Claver-Cortés, E., Pereira-Moliner, J., & Tarí, J. J. (2009b). Environmental practices and firm performance: An empirical analysis in the Spanish hotel industry. *Journal of Cleaner Production*, 7(5), 516–524. doi:10.1016/j.jclepro.2008.09.001
- Muhammad, N., Scrimgeour, F., Reddy, K., & Abidin, S. (2015). The relationship between environmental performance and financial performance in periods of growth and contraction: Evidence from Australian publicly listed companies. *Journal of Cleaner Production*, 102, 324–332. doi:10.1016/j.jclepro.2015.04.039
- National Statistics Institute (INE). (2018). Aportación del turismo al PIB de la economía española. Retrieved from <https://www.ine.es/jaxi/Tabla.htm?path=/t35/p011/2009/I0/&file=01001.px&L=0>.
- National Statistics Institute (INE). (2019). Índices de precios hoteleros. Base 2008. Retrieved from <https://www.ine.es/jaxiT3/Tabla.htm?t=12157&L=0>.
- Neugebauer, F. (2012). EMAS and ISO 14001 in the German industry-Complements or substitutes? *Journal of Cleaner Production*, 37, 249–256. doi:10.1016/j.jclepro.2012.07.021
- Orlitzky, M., Schmidt, F., & Rynes, S. (2003). Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3), 403–441. doi:10.1177/0170840603024003910
- Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How sustainability ratings might deter 'greenwashing': A closer look at ethical corporate communication. *Journal of Business Ethics*, 102(1), 15–28. doi:10.1007/s10551-011-0901-2
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction*. Belmont, CA: Wadsworth.
- Peiró-Signes, A., Segarra-Oña, M. D. V., Verma, R., Mondéjar-Jiménez, J., & Vargas-Vargas, M. (2014). The impact of environmental certification on hotel guest ratings. *Cornell Hospitality Quarterly*, 55(1), 40–51. doi:10.1177/1938965513503488
- Pereira-Moliner, J., Claver-Cortés, E., Molina-Azorín, J. F., & Tarí, J. J. (2012). Quality management, environmental management and firm performance: Direct and mediating effects in the hotel industry. *Journal of Cleaner Production*, 37, 82–92. doi:10.1016/j.jclepro.2012.06.010

- Pereira-Moliner, J., Font, X., Tarí, J. J., Molina-Azorin, J. F., López-Gamero, M. D., & Pertusa-Ortega, E. M. (2015). The Holy Grail: Environmental management, competitive advantage and business performance in the Spanish hotel industry. *International Journal of Contemporary Hospitality Management*, 27(5), 714–738. doi:10.1108/IJCHM-12-2013-0559
- Perles-Ribes, J. F., Ramón-Rodríguez, A. B., Sevilla-Jiménez, M., & Moreno-Izquierdo, L. (2016). Unemployment effects of economic crises on hotel and residential tourism destinations: The case of Spain. *Tourism Management*, 54, 356–368. doi:10.1016/j.tourman.2015.12.002
- Perles-Ribes, J. F., Ramón-Rodríguez, A. B., Sevilla-Jiménez, M., & Rubia, A. (2016). The effects of economic crises on tourism success: An integrated model. *Tourism Economics*, 22(2), 417–447. doi:10.5367/te.2014.0428
- Porter, M. E. (1991). America's green strategy. *Scientific American*, 264(4), 1–68. doi:10.1038/scientificamerican0491-168
- Porter, M. E., & Van Der Linde, C. (1995). Green and Competitive: Ending the stalemate. *Harvard Business Review*, September–October, 120–134.
- Ritchie, J. R. B., Amaya Molinar, C. M., & Frechtling, D. C. (2010). Impacts of the world recession and economic crisis on tourism: North America. *Journal of Travel Research*, 49(1), 5–15. doi:10.1177/0047287509353193
- Rivera, J. (2002). Assessing a voluntary environmental initiative in the developing world: The Costa Rican certification for sustainable tourism. *Policy Sciences*, 35(4), 333–360.
- Rodríguez-Antón, J. M., Alonso-Almeida, M. D. M., Celemin, M. S., & Rubio, L. (2012). Use of different sustainability management systems in the hospitality industry. The case of Spanish hotels. *Journal of Cleaner Production*, 22(1), 76–84. doi:10.1016/j.jclepro.2011.09.024
- Russo, M. V., & Minto, A. (2012). Competitive strategy and the environment: A field of inquiry emerges. In P. Bansal & A. J. Hoffman (Eds.), *The Oxford handbook on business and the natural environment* (pp. 29–49). Oxford: University Press.
- Segarra-Oña, M. D. V., Miret-Pastor, L., & Peiró-Signes, A. (2011). Is the food industry taking a proactive stance on environmental issues? Results from an empirical analysis. *Review of Business Information Systems (RBIS)*, 15 (5), 11–16. doi:10.19030/rbis.v15i5.6013
- Segarra-Oña, M. D. V., Peiró-Signes, A., Verma, R., & Miret-Pastor, L. (2012). Does environmental certification help the economic performance of hotels? Evidence from the Spanish hotel industry. *Cornell Hospitality Quarterly*, 53(3), 242–256. doi:10.1177/1938965512446417
- Segarra-Oña, M. D. V., Peiró-Signes, A., Verma, R., Mondejar-Jimenez, J., & Vargas-Vargas, M. (2014). Environmental management certification (ISO 14001): Effects on hotel guest reviews. *Cornell Hospitality Quarterly*, 14(8), 6–17. doi:10.1177/1938965513503488
- Sharma, S., Aragón-Correa, J. A., & Rueda-Manzanares, A. (2007). The contingent influence of organizational capabilities on proactive environmental strategy in the service sector: An analysis of North American and European ski resorts. *Canadian Journal of Administrative Sciences / Revue Canadienne Des Sciences de L'administration*, 24(4), 268–283. doi:10.1002/cjas.35
- Sharma, S., & Starik, M. (Eds.). (2002). *Research in corporate sustainability: The evolving theory and practice of organizations in the natural environment*. Northampton: Edward Elgar Academic Publishing.
- Song, H., Lin, S., Witt, S. F., & Zhang, X. (2011). Impact of financial/economic crisis on demand for hotel rooms in Hong Kong. *Tourism Management*, 32(1), 172–186. doi:10.1016/j.tourman.2010.05.006
- Testa, F., Boiral, O., & Iraldo, F. (2018). Internalization of environmental practices and institutional complexity: Can stakeholders pressures encourage greenwashing? *Journal of Business Ethics*, 147(2), 287–307. doi:10.1007/s10551-015-2960-2
- Testa, F., Rizzi, F., Daddi, T., Gusmerotti, N. M., Frey, M., & Iraldo, F. (2014). EMAS and ISO 14001: The differences in effectively improving environmental performance. *Journal of Cleaner Production*, 68, 165–173. doi:10.1016/j.jclepro.2013.12.061
- TOURSPAIN. (2019). Data from: *Turismo. Ficha de Coyuntura*. State Department for Tourism. Retrieved from <http://estadisticas.tourspain.es/es-es/estadisticas/fichadecoyuntura/paginas/default.aspx>.
- Vargas Sanchez, A., & Levy Mangin, J. P. (2008). Evaluating the dimensions of the environment management in the hospitality sector: The case of the Spanish province of Huelva. *International Journal of Business Environment*, 2(1), 17–37. doi:10.1504/IJBE.2008.016839
- Vivel-Búa, M., Lado-Sestayo, R., & Otero-González, L. (2019). Influence of firm characteristics and the environment on hotel survival across MSMES segments during the 2007–2015 period. *Tourism Management*, 75, 477–490. doi:10.1016/j.tourman.2019.06.015
- Wagner, M. (2010). The role of corporate sustainability performance for economic performance: A firm-level analysis of moderation effects. *Ecological Economics*, 69(7), 1553–1560. doi:10.1016/j.ecolecon.2010.02.017
- Wagner, M., & Schaltegger, S. (2004). The effect of corporate environmental strategy choice and environmental performance on competitiveness and economic performance: An empirical study of EU manufacturing. *European Management Journal*, 22(5), 557–572. doi:10.1016/j.emj.2004.09.013
- World Tourism Organization (UNWTO). (2017). Data From: *Tourism Highlights. 2017 Edition*. Retrieved from <https://www.e-unwto.org/doi/pdf/10.18111/9789284419029>.

World Travel and Tourism Council (WTTC). (2017). Data From: *Travel & Tourism. Economic Impact Spain 2017*. Retrieved from <https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2017/spain2017.pdf>.

Yrigoy, I., & Cañada, E. (2019). Fixing creditor-debtors' tensions through labor devaluation. Insights from the Spanish hotel market. *Geoforum*, 98, 180–188. doi:10.1016/j.geoforum.2018.11.012

Zeng, S., Tian, P., & Shi, J. (2005). Implementing integration of ISO 9001 and ISO 14001. *Managerial Auditing Journal*, 20(4), 394–407. doi:10.1108/02686900510592070