Ambidexterity, Alliances and Environmental Management System Adoption in Spanish Hotels

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Abstract: Competitiveness in the hotel sector and its effect on the environment involves integrating environmental issues in hotel management. Current environmental challenges often require firms to cope with contradictory processes. Ambidexterity is a firm's capability to deal with conflicting demands and could be helpful in increasing a firm's environmental management system (EMS) adoption. Furthermore, given the complexity of technological advances, environmental requirements demand inter-firm collaboration. The aim of this study is to further an understanding of how hotels can increase EMS adoption by providing a framework of the contributing effect of alliances and ambidexterity. Results from tests using logistic regression and bootstrapping techniques on a sample of 306 Spanish hotels confirm the importance of ambidexterity because of its positive and direct effect on EMS adoption, and because of the mediating effect, which helps transform the benefits of firms' participation in strategic alliances into their adoption of EMS. This study contributes to the literature on ambidexterity by highlighting the importance for firms to develop this capability. It also contributes to a better understanding of the drivers of EMS adoption, introducing the integrated effect of hotel participation in alliances and ambidexterity. Hotel managers should endeavor to develop ambidexterity capability to facilitate EMS adoption.

Keywords: ambidexterity; alliances; environmental certifications; environmental management systems; environmental performance; hotel sector

1. Introduction

The main purpose of this study is to further an understanding of how alliances and ambidexterity help improve environmental management system (EMS) adoption. Of the three main pillars of sustainability, according to the triple bottom line [1] (economic, environmental, and social), the focus of this study is on the environmental. The tourism industry plays a significant role in maintaining natural surroundings [2–4]. In the hotel sector, often with establishments located in special natural settings with constraints on resources [5], it is even more important to integrate environmental issues into management to reduce damage and to positively contribute to the preservation of natural resources. In fact, the traditional mass tourism models have increased the pressures on resources and the negative effects on landscapes, as clearly evidenced in popular destinations such as the Spanish resorts of Benidorm [6] and Tenerife [7]. Tourism firms have the opportunity to engage in preserving natural surroundings. Furthermore, by managing environmental performance, hotels both contribute to society and increase their competitiveness with better market opportunities toward increasingly environmentally conscious consumers [8], with cost reductions, and with access to better resources [9]. We specifically focus on environmental management systems (e.g., ISO14001 and EMAS), recognized by the Organisation for Economic Co-operation and Development (OECD) (2013) [10], as an important innovation for a green

economy in the tourism industry. This consideration is also in line with the literature that includes environmental certification as indicators of environmental innovations (e.g., [11,12]).

Environmental requirements demand frequently contradictory processes for firms, such as efficiency and flexibility or alignment and adaptability [13], which should be managed adequately. Ambidexterity has been proposed from the organizational learning perspective, as a concept that integrates conflicting demands. It could therefore contribute to the study of environmental management needs [13]. Ambidexterity is defined as the firm's capability to simultaneously achieve high levels of exploration and exploitation of organizational knowledge [14]. March [15] introduced the concepts of exploration as new searches and experimentation in organizational learning, and exploitation in the sense of using and improving the knowledge the firm already has, as the two connected sides of organizational learning. Scholars subsequently started to coin the concept of ambidexterity applied to the capability of combining or balancing both to ensure the firm's long-term success [16–18].

Furthermore, environmental challenges usually require collaboration with other organizations that can provide knowledge and skills in which the firm has no expertise [19,20]. According to the resource-based and dynamic capabilities view [21–25], firm-specific capabilities are the main source of sustainable competitive advantage. Inter-firm resources are also the key to accessing new knowledge and to increasing firm competitiveness, from the perspective of the relational view [26]. The complexity of environmental issues requires such inter-firm collaborations [19] in support of the firm's orientation toward increasing environmental performance [27].

Ambidexterity and exploration and exploitation are beginning to be analyzed as antecedents of environmental performance (e.g., [9]), and alliances have also been studied regarding their effect on this outcome [19] or on environmental management practices (e.g., [27]). Nevertheless, to our knowledge, this is the first study to further knowledge of environmental issues by integrating the analysis of the role of alliances and ambidexterity in environmental management system adoption in the hotel sector. Since meeting environmental challenges frequently entails the management of contradictory processes, the introduction of the ambidexterity capability in analyzing how to manage environmental issues is highly relevant [13,28]. This study addresses this gap in the literature by also integrating into the analysis the firm's external knowledge sources that could help them in solving the complex nature of environmental demands [19,27]. Therefore, the main contribution of the study is to provide empirical evidence of the positive effect of ambidexterity in adopting environmental management systems, and in transforming the benefits of alliances into increased possibilities of EMS adoption.

The remainder of the paper is structured as follows. First, the background of ambidexterity is introduced, together with the importance of strategic alliances. Then, hypotheses development is presented. Next, the data, measurement, and methodology are given in the Methods Section, followed by the Results Section and Data Analysis. Finally, implications of the study are derived, and limitations and future research lines outlined in the Conclusion Section.

2. Theoretical Background and Hypotheses

2.1. Theoretical Background

In dynamic environments, organizations must be ambidextrous to have success in the long term [29]. That involves exploring new knowledge, future processes, competencies, and skills, while efficiently exploiting their current knowledge, competencies, and processes [16,18]. March [15], explained the concepts of exploration and exploitation in organizational learning. While exploration refers to risk taking and variance-increasing activities in learning, experimentation, flexibility, discovering, and distant search, exploitation refers to refinement, efficiency, variance-decreasing activities, learning by doing, and local search [15,30]. Although they are different processes, both exploration and exploitation involve learning and knowledge [31–33]. In fact, both are presented by March [15] as two facets in organizational learning. The difference between them lies in the type or degree of knowledge on

which they are focused [17,34]. Whereas, exploration is about the creation of new knowledge through distant search, and learning through variation and experimentation, exploitation refers to the refinement and extension of knowledge, local search, and learning through experimental refinement [33–35]. Furthermore, both processes are mutually reinforcing [36]. These activities should be combined, since focusing on exploration to the detriment of exploitation can cause a "failure trap" without obtaining rewards for the variation-seeking activities, while excessive exploitation over exploration can lead to a "success trap" with only short-term returns [37].

The concept of ambidexterity has been studied by scholars of the organizational learning perspective (e.g., [37]), in the strategic management literature (e.g., [38,39]) innovation (e.g., [30,33,40]), and in environmental studies [9,28]. We follow the view of ambidexterity as a dynamic capability. Teece et al. [24], define dynamic capabilities as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" [24]. Ambidexterity is then considered a dynamic capability that facilitates new resource configurations [41] and involves combining the attainment of exploration and exploitation [17], which is a challenge because both usually require different processes and resources [33].

Furthermore, alliances are an important source of learning and access to new knowledge and to upgrade relevant skills [26,42,43]. The literature on strategic alliances, as well as on the innovation and open innovation paradigm (e.g., [44–48]) suggests the importance of firms' external knowledge sourcing. Combining different types of knowledge fosters innovation [49], and the increasing global dispersion of knowledge in the current dynamic environment [50] requires collaboration between different actors [51]. More specifically, external knowledge can be a source for fostering exploration as well as exploitation [51,52]. Although several studies differentiate between exploration and exploitation alliances (e.g., [53,54]), few have analyzed the effect of alliances on ambidexterity, as a whole capability. In line with Vrontis et al. [51], we take into account a firm's participation in alliances as beneficial for ambidexterity, since such alliances can act as a source of accessing new knowledge or knowledge in which the firm has no expertise.

We therefore address a gap in the literature by providing an analysis of ambidexterity as an antecedent of EMS adoption and as a mediating effect between firm participation in alliances and EMS adoption.

2.2. Hypotheses Development

Participation in alliances provides access to wider external knowledge, which could be different or specialized in other areas in which the firm has expertise. For example, hotels can collaborate with technological firms to apply and integrate new advances (e.g., applying the Internet of Things or artificial intelligence to its processes) in pollution prevention, efficiency, digital transformation of buildings, or even to develop new processes. Contact with richer information and knowledge enhances ambidexterity [55]. Access to external knowledge enables firms to expand their knowledge base, which could be integrated with internal knowledge to foster ambidexterity, through the improvement of current skills and processes or through the development of new ones, and access to new knowledge is beneficial for both [51]. Alliances therefore increase the possibilities of accessing different sources and perspectives that could be incorporated into the firm [56]. The amount and cognitive variation that external knowledge provides [31,57] is essential to exploration, since it could be difficult for a single firm to have the full range of necessary skills for the latest research breakthroughs [58]. Through interaction with new external knowledge, new ideas could be generated, addressing new challenges with new perspectives, fostering exploration, as well as reducing or sharing potential risks and uncertainty [58,59]. Moreover, for improving existing processes and skills, collaboration allows firms to complement and refine their knowledge base, thereby aiding exploitation [54,56]. Kauppila [59], shows how partnerships increase efficiency and improve existing knowledge, and that the internal exploitation is also necessary to recognize potential partners that could also achieve exploitation. Therefore, collaboration provides a source of knowledge that impacts positively on

the implementation of exploration and exploitation [54,56]. Knowledge exchanges with external sources could benefit the firm for the development of new products or services and new markets, and for the improvement of existing ones [55]. Partners support and complement firm exploration and exploitation with new resources [50]. Some researchers have tested the way in which alliances are crucial for managing their approach to ambidexterity (e.g., [50,59]). Bresciani et al. [50], tested whether firms combine external with internal knowledge to enhance ambidexterity. By analyzing a case study, Kauppila [59], showed how a Finnish firm achieves ambidexterity through the internal balance of exploration and exploitation while maximizing both thanks to its partnerships. Considering these antecedents, we propose the following hypothesis:

Hypothesis 1 (H1). *A firm's participation in alliances has a positive effect on its organizational ambidexterity.*

Change, improvement, and continuous learning is necessary to achieve sustainability [60,61]. The changing environment constantly demands new adjustments, and organizational capabilities are necessary to cope with these demanding changes around sustainability [60–62], and specifically, ambidexterity "enables a firm to adapt over time" [41]. Ambidexterity implies finding the optimal development of the processes necessary to use current knowledge and to create new knowledge, in order to cope with short- and long-term requirements, and adapt to and evolve with external demands [14,18,29].

The processes firms must develop to achieve ambidexterity include the ability to integrate and coordinate conflicting demands [28,29,62]. These processes provide an excellent arena in which to easily adopt environmental management programs that also require adapting to continuously new requirements. Firms will have a greater possibility of adopting environmental management systems if they have the capability to cope with constant environmental changes. In fact, Judge and Elenkov [63], demonstrate that the more organizations adapt and change, the higher their environmental performance will be; in turn, Carayannis et al. [64] propose ambidexterity as essential for sustainability. Lin and Ho [13] specifically tested this positive association between ambidexterity and environmental performance in the automotive industry. Chen et al. [28] focus on ambidexterity for green developments and, in a sample from the electronics industry, demonstrate how ambidexterity is helpful for increasing green innovation performance. Cillo et al.'s [65] review of sustainable innovations finds that new forms of management such as EMSs or standards and guidelines are also included in the literature analyzing this topic. They also conclude that these sustainable innovations require a balance between firm goals and environmental and social demands, in which the ambidexterity capability is significant in helping firms to process this integration by developing crucial abilities and resources.

Furthermore, the short- and long-term improvements that environmental challenges demand [13] are in line with what ambidexterity is able to achieve. The risk of obsolescence—or alternatively, the risk of overemphasis on totally new activities—in organizations that fail to develop organizational ambidexterity [35]—could deter the introduction of EMSs and the achievement of higher standards of environmental performance [13]. Exploitation enables adjusting and improving existing processes, which is beneficial for reducing environmental problems and refining their environmental standards, mainly in the short term, whereas exploration pursues new developments and processes, which could result in new knowledge to solve new environmental challenges in the long term [13]. While developing innovative solutions to new challenges stimulates creativity, it also enables potential improvements to existing knowledge [35]. Alternatively, improving knowledge and processes could prevent disturbances in the new developments for future challenges [13,66]. Additionally, ambidexterity must cope with multiple demands, such as alignment and adaptability [29] or efficiency and flexibility. This experience also enhances the likelihood of organizations achieving multiple goals, by focusing on environmental as well as financial goals [63,67].

Ambidexterity, as a dynamic capability, therefore helps the firm to address changing environments by integrating, building, and reconfiguring competences [24]. Processes and routines created to achieve

dynamic capabilities allow the integration and recombination of the firm's resource base with new resources to generate new activities [68]. If these processes are embedded within the firm, it will take advantage of them to adopt EMSs that also require the integration of different organizational resources and knowledge [69,70]. Environmental management entails flexibility and change [69,70] to cope with new environmental demands and to continuously improve on the goals achieved. Specifically, EMS adoption involves organizational commitment to continuous improvement from the outset [71], and ambidexterity—-rooted in the organizational processes that allow firms to develop and strengthen their knowledge and skills and improve the efficiency and productivity of their operations, while also learning new knowledge in new domains—-could provide an excellent context for continual environmental learning and improvement.

EMS adoption is therefore facilitated when a hotel has a well developed ambidexterity capability [13], which leads to the following hypothesis:

Hypothesis 2 (H2). *A firm's ambidexterity has a positive effect on its adoption of an EMS.*

The two previous hypotheses relate participation in alliances with ambidexterity and ambidexterity with EMS adoption. If we consider the previous hypotheses as a set, the relationship between the participation in alliances and EMS adoption is mediated by ambidexterity. We propose the mediating effect, considering that external knowledge acquired through alliances requires the firm to be able to integrate it in order to increase the efficiency of its operations, develop new skills, or find new environmental solutions. Internal firm knowledge and experience determine the integration of external knowledge, since learning is a cumulative process [72,73]. Internal firm capabilities increase the opportunity to recognize and integrate external knowledge [72]. The ambidexterity capability requires an effort to simultaneously achieve internal exploration and exploitation, which in turn enhance the skills needed to absorb new knowledge and information [40,74]. Without strong internal capabilities it could be more difficult for the firm to integrate the benefits of participating in an alliance [40,75]. The simple exposure to external knowledge is not enough per se for the firm to internalize it [40,72,76]. A firm's internal capabilities allow the integration of new external knowledge [68,77]. Specifically, we propose ambidexterity as a basic complement for the participation in alliances to have an effect on the firm's adoption of EMSs. In agreement with the main postulates of the resource-based view and dynamic capabilities approach, which state that the differences between firms lie in the bundle of resources and capabilities that they are able to develop, not all firms could benefit equally from participation in a strategic alliance. If a hotel wants to transform the benefits of alliances to develop its environmental processes, with their continuous requirement to meet new challenges, it needs an internal filter to interpret and use the acquired external knowledge. The ambidexterity capability constitutes this filter, which allows the firm to integrate external knowledge to produce novel ideas [28]. Lucena and Roper [78] demonstrate that ambidexterity mediates the relationship between alliances and innovation. Furthermore, in the context of tourism cultural clusters, Martínez-Pérez et al. [75] showed a mediating effect of ambidexterity between external relationships and innovation.

Together this leads us to hypothesize that:

Hypothesis 3 (H3). *A firm's ambidexterity mediates the relationship between participation in alliances and the adoption of an EMS.*

Figure 1 shows the proposed model.
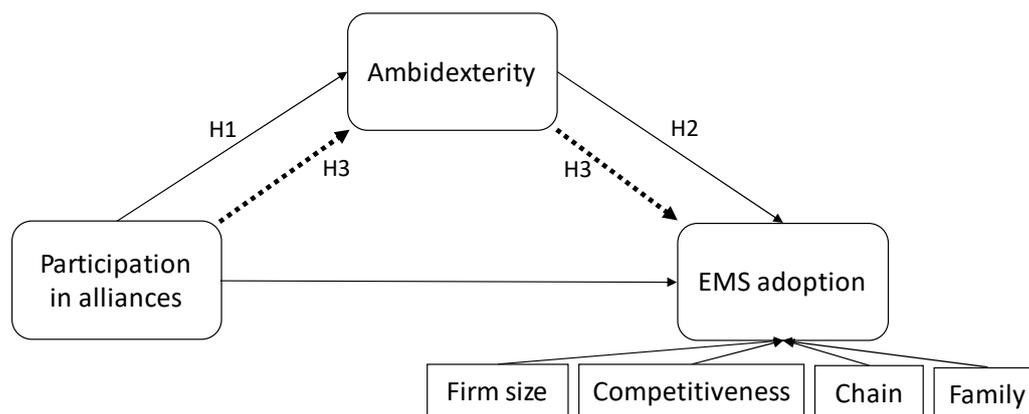
Figure 1. Hypothesized model. Continuous line represents direct effects; dotted line represents the mediating effect.

3. Methodology

3.1. Sample and Data Collection

Following recommendations in the literature about survey research design and data gathering [79,80], data was collected through a survey completed by the owner, manager, or CEO of tourism firms in Spain from the reference universe provided by the National Statistics Institute's Central Directory of Spanish Companies. The survey instrument was pretested (eight managers, five academics) before the final version was applied. It includes reversed items and some similar questions in different sections to control for response reliability, as well as mixed questions from different constructs. Between December 2009 and March 2010, 1019 usable responses were obtained from the tourism sector universe, which reflects a statistical margin of error of ±3.1 percent (confidence interval of 95.5 percent). Since our arguments in the hypothesis development section are based on the improvements and learning involved in EMS, our data are relevant to draw conclusions about the relationships proposed given the fact that constant enhancement is still the idea behind EMS. Non-response bias was checked by comparing early and late responses [81] and no problems were detected. This sample is composed of different sub-sectors (e.g., hotels, restaurants, or travel agencies). As this research is focused on hotel firms, the final sample for the present study includes 306 firms.

3.2. Variable Measurement

3.2.1. Dependent Variable

Environmental management systems have represented a trigger for firms responding to environmental challenges [82]. Their aim is to manage environmental firm performance by continuously improving it though a planned strategy [83]. ISO 14001 and EMAS represent the most important systems [84–86], and some authors have used them as an indicator of implementation of good environmental practices. Arimura et al. [87] specifically demonstrate that ISO14001 help firms reduce environmental impacts. In line with Martínez-Pérez et al. [11], who consider all types of innovation leading to environmental improvements as eco-innovations in the tourism sector and include the implementation of environmental certificate systems among them, we focus on these systems as our measure for the dependent variable. This is also in line with the OECD (2013) inclusion of EMSs as one of the important innovations in tourism for the transition to a green economy.

The International Organization for Standardization (ISO) developed standards of environmental management included in ISO 14001, whereas the European Union promoted EMAS (Eco-management and Audit Scheme) certification. Therefore, we take these systems into account in our variable measurement.

Thus, environmental management system adoption is measured as a binary variable. It takes the value of 1 if the firm has been certified with environmental systems such as ISO 14001 or EMAS,

and 0 otherwise. This certification assures that the hotel has taken steps to enhance its systems and processes to improve environmental performance. Other authors use similar approaches to measuring EMS implementation [88] and the same measure has been adopted in studies with hotels (e.g., [89,90]). Table 1 shows the measurement of the variables.

Table 1. Measurement of variables.

Variable	Measurement	Authors
EMS	Binary coded (1 if the hotel has EMS certification ISO 14001 or EMAS; 0 otherwise)	[88–90]
Alliances	Binary coded (1 if the hotel has technological or environmental alliances; 0 otherwise)	[91–95]
Ambidexterity	*Exploration: Over the last three years, to what extent has your firm . . . "* 1. Acquired manufacturing technologies and skills entirely new to the firm? 2. Learned product development skills and processes (such as product design, timing of new product introductions, and customizing products for local markets) entirely new to the industry? 3. Acquired entirely new managerial and organizational skills that are important for innovation (such as forecasting technological and customer trends; identifying emerging markets and technologies; coordinating and integrating R&D; marketing, manufacturing and other functions; managing the product development process)? 4. Learned new skills in areas such as funding new technology, staffing R&D function, training and development of R&D, and engineering personnel for the first time? 5. Strengthened innovation skills in areas where it had no prior experience? *Exploitation: Over the last three years, to what extent has your firm . . . "* 1. Upgraded current knowledge and skills for familiar products and technologies? 2. Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations? 3. Enhanced competencies in searching for solutions to customer problems that are near to existing solutions rather than completely new solutions? 4. Upgraded skills in product development processes in which the firm already possesses significant experience? 5. Strengthened its knowledge and skills for projects that improve efficiency of existing innovation activities?	[96,97]
Size	Logarithm of number of employees	[98]
Competitiveness	Our company has relatively strong competition Competition in our local market is extremely high Price competition is a hallmark of our local market	[99]
Chain affiliated	Binary variable (1 if the hotel belongs to a chain; 0 otherwise)	[98,100–103]
Family firm	Binary variable (1 if the firm is a family firm; 0 otherwise)	[104]

3.2.2. Independent Variable

The variable Alliances takes the value of 1 if the hotel has technological, innovation, or environmental alliances, and 0 otherwise. Other studies have used similar measures for alliances. In a study of R&D alliances, Sampson [91] uses an analogous approach to measure alliance experience. In another recent study, Yang and Meyer [92] use a dummy variable where 1 represents firms that use alliances and 0 firms that do not. Moreover, the study by Rossmannek and Rank [93] uses dummy variables to control participation in alliances, tests for differences between distinguishing dummies and different types of alliances, or creates a dummy variable for participation or not in all types of alliances. Alam et al. [94] also create a dummy variable for firm participation in alliances to then divide the sample according to this variable.

3.2.3. Mediating Variable

Ambidexterity is calculated as a multiplicative term of exploration and exploitation, in line with Gibson and Birkinshaw [29], who consider whether exploration and exploitation complement each other, and ambidexterity as the non-substitutable combination of both. Other authors have also used a multiplicative approach for measuring ambidexterity (e.g., [13,29]).

In this study, exploration and exploitation are based on the scales by Camisón et al. [96] and Atuahene-Gima [97], which follow the conceptualization of exploration and exploitation in the seminal paper by March [15], and which have shown their appropriateness for tourism studies [96]. Each scale is calculated through the mean scores of the scale's items to generate composite scores [105]. Exploration and exploitation are calculated as the average of five items, respectively, with a seven-point Likert scale in answers (Cronbach alpha for exploration = 0.889; Cronbach alpha for exploitation = 0.924). Table 1 shows the items in the scale. Principal component analysis was also performed to assure validity, and the amount of variance explained is 71.491%, thus exceeding 50%, with the loading factors loading in the appropriate scale and with values higher than 0.6, exceeding the cut-off point of 0.5 [105]. Given the fact that Cronbach's alpha for both scales exceeds the threshold point of 0.7 [106], reliability is also assessed.

3.2.4. Control Variables

Size. Firm size has been shown to affect ambidexterity [14,39,107], as well as environmental proactivity (e.g., [9]). We therefore use firm size as a control variable. As with other studies in ambidexterity in the hotel sector (e.g., [98]), we take the logarithm of number of employees as a measure of the variable size.

Competitiveness. External pressures affect ambidexterity [40,108] and environmental performance [13]. We therefore use it as a control variable. This study uses Chang et al.'s ([99] environmental competitiveness scale (Cronbach's alpha = 0.662); the items from this scale are shown in Table 1.

Chain Affiliated. Since belonging to a hotel chain has been demonstrated to influence environmental performance [109] or environmental commitment [100,110], we include a dichotomous variable to measure whether hotels belong to a chain, a measure adopted in other hotel studies (e.g., [101,102] and in studies that specifically analyze ambidexterity in hotels (e.g., [98]) or environmental strategies in hotels [100,103].

Family Firm. The specific characteristics of family firm ownership would influence ambidexterity (e.g., [39,111]), as well as environmental performance [112,113]; we also control for family ownership. In line with Lubatkin et al. [39], we use a dichotomous variable coded as 1 if the firm is a family firm and 0 otherwise. The criteria for distinguishing between both depend on the manager interviewed, as in other studies of family firms in the tourism context (e.g., [104]).

3.3. Method

Given the dichotomous nature of the dependent variable, binary logistic regression analysis is used to test hypotheses H2 and H3, whereas linear regression is used to test H1, where the dependent

variable is ambidexterity. Other studies in these topics, also with a different nature of dependent and mediating variables, follow a similar approach (e.g. [95,114]). We apply the procedure proposed by Baron and Kenny [115] to test the mediating effect by estimating different regressions, an approach also used in studies on this topic (e.g., [13]).

Furthermore, we confirm the results by applying bootstrapping techniques [116] with the PROCESS Macro [117] in SPSS, which allow for testing mediating effects. Other environmental studies also use these techniques (e.g., [118]).

4. Results

Table 2 shows descriptive statistics of variables and correlations.

Table 2. Descriptive statistics and correlations.

	Variable	Mean	S.D.	1	2	3	4	5	6
1	EMS adoption	0.25	0.44						
2	Alliances	0.27	0.44	0.23 **					
3	Ambidexterity	16.35	9.22	0.29 **	0.25 **				
4	Size	1.23	0.73	0.29 **	0.37 **	0.33 **			
5	Chain	0.32	0.47	0.12 *	0.15 **	0.01	0.48 **		
6	Family firm	0.53	0.50	0.08	0.04	0.31 **	0.05	−0.12 *	
7	Competitiveness	4.50	1.05	0.09	0.17 **	0.29 **	0.24 **	0.06	0.10

Note: Env. Performance = Environmental performance; S.D. = Standard Deviation; ** $p < 0.01$; * $p < 0.05$; N = 306.

Results are presented in Table 3. Linear regression is used in Model III (Table 3), where the dependent variable is Ambidexterity. Binary logistic regression analysis is used in all the other models (Table 3) with the dependent variable Environmental performance. In Model I, only the control variables are introduced. Model II adds the independent variable (Alliances) for their effect on environmental performance. Model III tests the effects on ambidexterity. In Model IV, again the dependent variable is environmental performance and the mediating variable, ambidexterity, is introduced. The variance inflation factor (VIF) gives a maximum of 1.459 within all models, below the cut-off threshold of 10 for linear regression models [119], or 2.5 for logistic regression [120], thereby indicating the unimportance of multicollinearity. As for control variables, although the effect is not significant in models where environmental performance is a dependent variable (except in Model 1, where the variable size is significant), and the chain affiliation variable has shown no significant effect in any of the models, control variables have shown their importance in Model III, supporting the effects on Ambidexterity of size, competitiveness, and family firm, proposed in the literature.

Testing hypothesis 1 involves analyzing the coefficient of firm participation in alliances on the regression with ambidexterity as a dependent variable. Thus, observing Model III (Table 3), the coefficient of alliances on ambidexterity is positive and significant (β = 0.190; $p < 0.01$), thereby supporting hypothesis 1.

Hypothesis 2 is also supported, showing ambidexterity as a predictor of environmental performance, given the positive and significant effect of ambidexterity on environmental performance (Table 3) shown in Model IV (B = 0.046; $p < 0.05$; Lower 95% CI = 1.006; Upper 95% CI = 1.090).

Hypothesis 3 predicts a mediating effect of organizational ambidexterity in the relationship between alliances and EMS adoption. According to Baron and Kenny [115], testing the mediation effect involves three steps. The first step is to examine the effect of the independent variable on the dependent variable, which is shown in Model II in Table 3. It gives a positive and significant coefficient of alliances (B = 0.801; $p < 0.05$; lower 95% CI = 1.150: upper 95% CI = 4.316). The next steps in the process were performed when testing Hypotheses 1 and 2, since it involves analyzing the effect of the independent variable on the mediator variable (H1) and confirming the positive effect of the mediator variable on the dependent one (H2). The additional step required is to confirm whether the introduction of the mediator variable in the model renders the effect of the independent variable

(alliances) on the dependent variable (environmental performance) insignificant. Model IV in Table 3 shows that the introduction of the mediator variable reduces the effect of alliances shown in Model II, which is no longer significant (B = 0.659; $p > 0.05$; lower 95% CI = 0.0985; upper 95% CI = 3.792), thus testing Hypothesis 3 of the mediator effect and specifically resulting in a full mediation effect.

Table 3. Results of the regression models.

	Model I (Logit Regression)	Model II (Logit Regression)	Model III (Linear Regression)	Model IV (Logit Regression)
Dependent variable	*EMS adoption*	*EMS adoption*	*Ambidexterity*	*EMS adoption*
Variables	**B (SE)**	**B (SE)**	*B (t)*	**B (SE)**
Intercept	−2.378 ** (0.735)	−2.432 ** (0.749)		−2.619 (0.766)
Size	0.779 ** (0.260)	0.599 * (0.275)	3.309 *** (4.326)	0.453 (0.286)
Chain	0.111 (0.358)	0.159 (0.366)	−0.032 (−0.468)	0.203 (0.368)
Family firm	0.227 (0.321)	0.241 (0.327)	0.141 * (2.360)	0.154 (0.334)
Competitiveness	0.060 (0.161)	0.063 (0.163)	1.190 ** (3.143)	−0.033 (0.171)
Alliances		0.801 * (0.337)	0.190 ** (3.017)	0.659 (0.344)
Ambidexterity				0.046 * (0.020)
Coc & Snell R^2	0.065	0.088		0.110
Nagelkerke R^2	0.093	0.126		0.157
Adjusted R^2			0.232	

Notes: *** $p < 0.01$; ** $p < 0.01$; * $p < 0.05$; figures in parentheses show standard errors (SE) in logistic models. (Models I, II and IV) and t statistics in linear regression (Model III).

To confirm this mediating effect, we also apply the bootstrapping procedure [116] by running the PROCESS Macro with 5,000 bootstrap samples. Results confirm the previous analysis and show that the mean indirect effect is positive and significant ($p < 0.05$), with a 95% confidence interval that does not include zero (LLCI = 0.0201; ULCI = 0.4320), whereas the confidence interval for the direct effect is not significant ($p > 0.05$) and the 95% confidence interval includes zero (LLCI = −0.0156; ULCI = 1.3329). Therefore, the full mediating effect—-or in terms of Zhao et al.'s [116] classification, a indirect-only mediation effect—-is confirmed, which also implies that alliances impact the adoption of EMSs through their effect on the mediating variable, with no direct effect.

5. Discussion

The results of this study confirm the proposed hypotheses with a Spanish sample. They show that hotel participation in alliances has a positive effect on ambidexterity and ambidexterity a positive effect on environmental performance, in addition to acting as a mediating variable between both. These results therefore advance on the recent line of research that proposes the importance of ambidexterity for managing environmental requirements (e.g., [9,13,28]). Hotel managers that devote resources for simultaneously managing and enhancing exploration and exploitation (i.e., for developing the ambidexterity capability) can improve firm environmental results through EMS certification. Scholars have proposed that, though ambidexterity supposes a challenge for firms, it is necessary for their long-term success [16–18]. This study expands this line by also showing its positive effect on environmental performance, thereby confirming the importance of developing this capability for firms, and specifically for hotel establishments.

Furthermore, ambidexterity is not only relevant for its positive effect on environmental performance. For hotels participating in alliances, it exerts a mediating effect, that is, it is beneficial for transforming the benefits of alliances into better results in terms of environmental performance. In the complex and dynamic competitive arena, where it is difficult for a firm to obtain all the knowledge necessary for managing environmental challenges, collaboration with other firms is often required [44,47,48]. The results of this study reveal that a firm's ambidexterity capability is also fundamental for incorporating the benefits of alliances. In other words, alliances are beneficial for environmental management when

a hotel has developed the ambidexterity capability (full mediation effect). It constitutes a filter for firms integrating the knowledge they have accessed to improve their environmental performance.

6. Conclusions

Hotels play an important role in preserving the natural environment. Their competitiveness is also linked to their green behavior: it could reduce costs and the use of resources. Also, introducing EMS, having certification, and increasing environmental performance could enhance a firm's reputation [121], consumer identification with the firm [122] and therefore firm positioning, competitiveness, and access to better resources [9].

This study focuses on EMS in the hotel sector. To adopt EMS, hotels should develop capabilities that allow them to balance conflicting environmental demands with new environmental challenges [13]. Among the different dynamic capabilities proposed in the literature, we analyze ambidexterity because it is a capability that facilitates the reconciliation of conflicting demands and is therefore useful for coping with environmental requirements [9,13]. Furthermore, hotels should regularly collaborate with external partners to confront increasingly complex environmental challenges [19,20,27], by accessing knowledge outside their area of main expertise.

This study contributes to the literature on ambidexterity by highlighting the importance for firms to develop this capability. It also contributes to a better understanding of the drivers of environmental performance by introducing the integrated effect of hotel participation in alliances and ambidexterity. Although recent studies have advanced the importance of ambidexterity in this outcome (e.g., [9,13]), we contribute by testing how ambidextrous hotels attain higher degrees of environmental performance and transform their participation in alliances into positive effects.

These results have important implications for hotel managers. Their decision to enter into an alliance to access new knowledge to improve environmental performance should take into account that their collaboration may not render the expected rewards, unless they develop their own firm's ambidexterity capability. Furthermore, per se, ambidexterity is also beneficial for better environmental performance. Therefore, though difficult, investing in the development of ambidexterity will only have positive effects.

The limitations of this study also uncover avenues for future research. First, the study does not distinguish between types of alliance or examine in-depth the knowledge generated or accessed through the alliance. Focusing on the specific outcomes of particular alliances should provide further understanding on how hotels can specifically benefit from each partnership. Second, though absorptive capacity is not included, its analysis can aid understanding of how knowledge acquired in alliances is internalized by the hotel. Third, the data analyzed are cross-sectioned and collected through a survey in 2010. Reaching conclusions on causality is therefore difficult, and subjectivity is present. Longitudinal research including more recent years and objective indicators, such as waste or pollution reduction, could provide further insights. Even so, the relationships proposed have been tested and the focus on the continuous improvement of the environmental standards on which the hypotheses are based is acquiring growing relevance. Therefore, this research contributes to the analysis of the fundamental role of organizational ambidexterity in explaining adoption of EMSs in hotel firms.

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