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ENVIRONMENTAL MANAGEMENT IN SMEs: ORGANIZATIONAL AND SECTORAL DETERMINANTS IN THE CONTEXT OF AN OUTERMOST EUROPEAN REGION

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Abstract. This paper evaluates the environmental behavior of SMEs in the Canary Islands (Spain), one of the Outermost European Regions. The islands' fragile socioeconomic systems and scarce resources noticeably condition the competitiveness of their firms. An empirical analysis ranks environmental protection practices in SMEs and identifies differences on the basis of size and business sector. In addition, groups of firms with different environmental behavior are identified to facilitate the design of environmental policies, improve effectiveness in decision making and the more efficient use of resources. From a theoretical perspective, this paper contributes to the gap identified by the precursors of the Natural Resource-Based View of the firm by analyzing specific resource combinations that each firm can use to improve its environmental performance and achieve competitive advantages. The firms best positioned to develop the dynamic capabilities needed are identified not only considering the physical environment, but also the socio-economic one and key intangible resources are measured that shape firms' environmental strategy.

Keywords: environmental management, small and medium-sized enterprises, OERs, sector, Resource-Based Theory, Rasch Measurement Theory.

JEL Classification: M14, M21, Q55.

Introduction

Island territories face considerable challenges to achieve sustainable development and firms play a key role in this development. The predominance of small and medium-sized enterprises (SMEs) in Europe, particularly in Outermost European Regions (OERs), justifies the interest in analyzing the determinants of SMEs' competitiveness in these regions, especially as islands are often conditioned by fragile socioeconomic systems and a globalized context that exacerbates environmental problems (Benito-Hernández *et al.* 2016). Therefore, SMEs of OERs must achieve compatibility between competitiveness and sustainability to guarantee their survival.

The insular condition of the majority of the OERs as well as demographic pressure and the steady growth of tourism have had a great impact on the natural environment and increase the complexity and cost of sustainable development in these regions (Calado *et al.* 2014; Gil *et al.* 2012). Furthermore, from a scientific and social science perspective, "islands present themselves as self-contained units to examine sustainability" (Baldacchino 2007: 14). Moreover, the specific features of insular settings make it difficult to generalize conclusions from their study. This is why island studies are a growing field of research that should be more fully explored (Pugh 2016), considering distinct cultural geographies and islands' varying performances (Stratford *et al.* 2011). Indeed, their analysis should not be considered as a pursuit by islands/islanders, or *with* them, not even *for* them, but *of* them (Baldacchino 2008; Stratford *et al.* 2011).

In the literature, there is a gap concerning whether SMEs are ideally placed to gain competitive advantages through environmental management -EM- (Torugsa *et al.* 2012; Aragón, Iturrioz 2016; Benito-Hernández *et al.* 2016). In this respect, Resource-Based Theory (RBT) (Barney 1991, 2001a, 2001b; Barney *et al.* 2001) is one of the most widely-accepted theoretical approaches to understand how corporate social and environmental responsibility (CSR) can contribute to create competitive advantage (Aguinis, Glavas 2012; Frynas, Stephen 2015). According to RBT, the limitations that SMEs have to access strategic resources could be offset by their ability to develop specific 'capabilities' (e.g., greater flexibility, innovation, proximity, etc.) and to design proactive social and environmental strategies to create value and differentiate themselves. However, RBT has been under utilized in research into CSR in SMEs, compared to other approaches such as Stakeholder Theory that focuses on external drivers rather than internal ones (Herrera-Madueño *et al.* 2016; Frynas, Stephen 2015; Frynas, Yamahaki 2016; Rodríguez-Fernández 2016).

Another aspect scarcely explored is the heterogeneity of environmental behavior among small and medium-sized enterprises and their varied CSR practices. So far, most studies have focused only on the implementation of formal and certifiable processes of EM, with the industrial sector being the most studied, as it is subject to greater regulatory control.

Bearing in mind these research challenges, this paper contributes to both theoretical and empirical perspectives. Firstly, it addresses the gap in the literature pertaining to the utilization of RBT, and its particular application to natural resources: the Natural Resource-Based View of the firm (NRBV) (Hart 1995), focusing on SMEs' internal dynamics to develop value-creating responsible strategies. This paper also provides advances in the measurement of unobservable variables (Godfrey, Hill 1995) that are the theoretical core of the RBT (Barney *et al.* 2001, 2011). Additionally, it contributes by proposing a matrix with different profiles of EM in SMEs. This permits the identification of the best positioned firms to develop the dynamic capabilities needed to bring clean technologies to market. Moreover, the heterogeneity of EM is explored among small and medium-sized firms, according to gaps identified in literature (Barney *et al.* 2011; Hart, Dowell 2011; Brammer *et al.* 2012). There is also a comparison between business sectors, given that significant differences exist in the nature of EM depending on the greater or lesser

orientation to the customer (Armas-Cruz 2011). This is especially important in small isolated islands, where industry is less important compared to sectors such as services. This comparison is useful as the composition of the business fabric of the Canary Islands (Spain) is representative of the determining features of an OER.

The paper is structured as follows. First, a theoretical framework reviews the basis of strategic management of the environmental factor, with special reference to SMEs determinants and sectoral particularities. This supports the proposal of a measurement scale that will be applied in the context of the Canary Islands. Second, an empirical study examines the interaction of both organizational aspects and specific EM ones using an objective measurement instrument. Finally, the paper presents the discussion of the results and conclusions.

1. Theoretical foundations of environmental management

Transaction Cost Theory (Coase 1937; Williamson 1985), Agency Theory (Jensen, Meckling 1976) and Resource-Based Theory (RBT) (Barney 1991) reveal the central role of state-unobservable constructs in strategic management literature (Godfrey, Hill 1995: 520). This paper focuses on RBT's internal capacities, particularly organizational ones, such as EM, and the relevance achieved by this theory in the 1990s as an alternative to other environmental models (Porter 1980) to explain the origin of firms' competitive advantages.

RBT (Barney 1991, 2001a, 2001b; Barney *et al.* 2001) affirms that the characteristics that enable a resource or capability to generate a sustainable competitive advantage are: heterogeneity, imperfect mobility, and ex-ante and ex-post limits to competition. Several authors have explained the presence of these characteristics in the environmental context (McWilliams, Siegel 2011; Wong *et al.* 2015: 42).

First, there is heterogeneity in the environmental behavior of firms, as they use different production factors (natural and unnatural) and generate different emissions. This heterogeneity is also due to the development of valuable organizational capacities, which is a dynamic and adaptive process, based on skills as well as processes and procedures (Teece 2007). As a result of above, there are ex-post competition limits of environmental protection activities that make it difficult for competitors to imitate these activities (McWilliams, Siegel 2011; Wong *et al.* 2015).

Second, there is imperfect substitutability, since for environmentally-conscious customers; there are often no substitutes for the products or for the environmentally responsible organizations they wish to purchase from. In addition, there are barriers that prevent firms from imitating identically the environmental protection system of others due to the socially complex and tacit character of environmental protection, which is based on the learning and continuous improvement of firms' employees and personnel (Hart 1995; Wong *et al.* 2015).

These aspects are known as first mover advantages and are associated with a better environmental reputation and greater efficiency in the use of resources. Certain addi-

tional assets (technical, interpretative structures and a network of efficient communication) are also required to successfully incorporate environmental protection activities into firms (Christmann 2000; López-Gamero *et al.* 2009; Porter, Van der Linde 1995). However, with respect to firms' green reputations, Jong *et al.* (2014) point out that firms must prove that they are consistently sustainable in the long term before obtaining any market-related benefits through increased customer base.

Third, a firm's environmental management has imperfect mobility, since these practices are specially designed for its particular activities and needs (Gupta, Sharma 1996; Wong *et al.* 2015). Finally, there are ex-ante limits to competition explained in part by the above first mover advantages in incorporating environmental technologies, as well as the need for a learning curve in incorporating environmental technologies and improving environmental performance (Christmann 2000; Porter, Van der Linde 1995).

Thus, from the RBT emerges the Natural Resource-Based View of the firm (NRBV0 (Hart 1995), which links this approach to environmental protection. NRBV proposes that the ability to integrate the natural environment into the strategic planning process and offers a firm the chance to develop an organizational capability that is valuable, potentially rare, and difficult to imitate. This approach includes the constraints and challenges that the natural environment places on a firm, and "how resources and capabilities rooted in the firm's interaction with its natural environment can lead to competitive advantages" (Barney *et al.* 2011: 1310).

Subsequent studies have reaffirmed the utility of NRBV to analyze the integration of the environment variable in a firm's strategic planning to generate a sustainable competitive advantage (Armas-Cruz 2011; Herrera-Madueño *et al.* 2016; Larrán-Jorge *et al.* 2015; López-Gamero *et al.* 2016; Martín-de Castro *et al.* 2016; Mohd *et al.* 2015; Tomomi 2010). This is possible by making use of three interconnected strategies: pollution prevention, product stewardship and sustainable development to achieve superior performance by reducing costs, preempting competitors and enhancing future position (Mohd *et al.* 2015: 413; Wong *et al.* 2015: 35, 46). Additionally, it is necessary to consider the moderating effect that the organizational context has on the deployment of a firm's capability to integrate stakeholders' perspectives in developing its environmental strategy (Rueda-Manzanares *et al.* 2008; Verbeke *et al.* 2006).

Moreover, Verbeke *et al.* (2006) and Martín-de Castro *et al.* (2016) indicate that, to obtain superior performance, not only is the design of the environmental strategy important but also an adequate investment in certain resource domains (employees' green skills, formal environmental systems, etc.) that increases the possibility of developing valuable capabilities by improved learning and stakeholder integration.

Currently, both the RBT and the NRBV continue to underpin advances in research, as indicated by their precursors (Barney *et al.* 2011; Hart, Dowell 2011). They identify a number of areas for further inquiry that our research aims to contribute to. On the one hand, this paper analyses the strategic capabilities of "pollution prevention" and "clean technology" identified by Hart and Dowell (2011). On the other, it investigates how firms combine their resources to improve their environmental performance, and

which firms are best positioned to develop the dynamic capabilities needed to bring clean technologies to market. Also, according to these authors, and in our paper, both the theoretical approach and the measurement instrument must conceptualize the environment from a broad perspective, taking into account not only the link between a firm and the physical environment, but also the firm's relationship with stakeholders and the socio-economic environment in which it operates.

Barney *et al.* (2011) proposed that one of key issues in RBT today is the measurement of resources because many of them are intangible, as stated by Godfrey and Hill (1995). They find that "intangible resource assessment and construct validation are often performed as mechanical, empirical, and uni-disciplinary and uni-level processes rather than as a conceptual, multidisciplinary, multilevel, and theoretical one" (Barney *et al.* 2011: 1311). Furthermore, they consider that applications of RBT should evolve towards a combination of quantitative and qualitative approaches. In this sense, our paper contributes by applying methods and measurement models of latent variables linked to the Modern Test Theory. These contributions are in line with other developments already present in the literature on Strategic Management such as those presented by Oreja-Rodríguez and Armas-Cruz (2012) within the field of Rasch Measurement Theory and those of Carroll *et al.* (2016) in the context of the Item Response Theory.

2. Environmental management in SMEs

The economic relevance of SMEs, especially in Europe (99% of all businesses in 2016), suggests that their environmental impacts warrant greater attention. However, empirical research into EM in SMEs is much sparser than for large corporations (Gadenne *et al.* 2009; Jamali *et al.* 2009). Several reasons for this apparently low level of engagement with environmental issues among SMEs have been advanced in previous research.

According to Brammer *et al.* (2012: 425), "small businesses have different behavioral characteristics compared to larger firms regarding EM. In general, SMEs have relatively informal organizational structures and are often managed by owners". As a result, personal attitudes, leadership skills and environmental information available to owners can greatly affect socially responsible behavior (Aragón, Iturrioz 2016; Herrera-Madueño *et al.* 2015; Moore *et al.* 2009). On the other hand, SMEs have greater levels of flexibility to respond to the business environment and competitors' actions (Aragón-Correa *et al.* 2008). Besides, for SMEs, it is essential to establish cooperative relationships with key stakeholders, which allow them access to external funding and business opportunities to improve their social-environmental performance (Aragón, Iturrioz 2016; Benito-Hernández *et al.* 2016).

In general terms, SME management does not develop a strategic approach to EM towards achieving competitive advantages (Graafland *et al.* 2003; Jamali *et al.* 2009; Revell, Blackburn 2007). The majority limit themselves to compliance with legal requirements and those of their principal stakeholders, bearing the costs involved (Benito-Hernández *et al.* 2016; Lepoutre, Heene 2006; Udayasankar 2008). The low formalization of EM of SMEs is seen even more in economically vulnerable contexts (Jamali

et al. 2009) like OERs. So, the likelihood of SMEs taking on the increasingly complex challenges of sustainability is conditioned by their ability to integrate it properly into their policies (Blundel *et al.* 2013).

However, Brammer *et al.* (2012) and Nybakk and Panwar (2015) consider that SMEs are not a homogeneous group with respect to socio-environmental management. So, it is of interest to identify specific features within this segment, for example, differences between small and medium-sized enterprises, which are the object of analysis in our study.

In addition, in the literature, there has been insufficient emphasis placed on the specific competences that firms should develop to facilitate the adoption of environmental protection practices, especially collaboration with other firms and product innovation (Hofmann *et al.* 2012). In short, it is necessary to study the environmental performance of SMEs in particularly complex contexts of competition, such as those of OERs. These kinds of contexts can influence the organizational and management features that explain SMEs' EM.

Finally, with respect to sectoral differences in EM, Banerjee (2002) identifies sectoral features that moderate the relationship between corporate environmentalism and business performance, such us the degree of environmental regulation, the level of environmental impact a sector produces and the level of concern society has regarding a specific sector's environmental behavior. Particularly, Husillos and Álvarez-Gil (2008) find that sectors with a direct environmental impact display greater transparency when declaring their environmental practices. So, our study aims to widen this perspective of the disclosure of environmental information and to analyze whether sectoral differences exist at the level of development of EM.

3. Methodology

This study proposes "environmental management" (EM) as its central construct of analysis (Armas-Cruz 2011; Oreja-Rodríguez, Armas-Cruz 2012). This construct is updated in terms of its theoretical delimitation and use as a measurement instrument applicable to the specific context and internal peculiarities of SMEs. Table 1 compiles the theoretical background that supports the construct, dimensions and proposed items.

According to Bos-Brouwers (2010) and Gadenne *et al.* (2009), the analysis of EM, and more specifically in the context of SMEs, must examine the broad complexity and diversity of practices that reflect the environmental concerns of a firm, covering from more strategic and planning questions to more operative and commercial tasks. Thus, this paper applies this transverse vision of EM to gather better the diversity depending on a firm's size and sector.

In addition, the paper analyses other aspects of management highly significant to complete the environmental profile of SMEs (Aragón-Correa *et al.* 2008; Fassin 2008; Hofmann *et al.* 2012; Lawrence *et al.* 2006; López-Gamero *et al.* 2009), such as: "business resources devoted to environmental protection" and "situation of a firm with regard to accreditation/certification of its EM".

Accordingly, the following specific objectives are proposed:

1. To validate the EM construct (Armas-Cruz 2011; Oreja-Rodríguez, Armas-Cruz 2012) when it is applied to SMEs in an insular setting. A measurement instrument is proposed that is capable of correctly evaluating the environmental behavior of SMEs in the context of specific geographical, environmental and socioeconomic characteristics, like the Canary Islands.
2. To analyze the hierarchization of environmental practices in SMEs.
3. To obtain a typology of Canary Island SMEs, as an example of an OER context, as a result of their level of EM and other aspects of management (resources employed, motivation and obstacles to EM) and to determine whether differences exist in the environmental behavior of SMEs according to their size and sector.

3.1. Measurement instrument

A questionnaire has been designed to measure the construct EM in SMEs' which includes a block of 12 questions that lists the (practical) most representative actions of EM in Canary Islands SMEs (Table 1). The measuring range is ordered polytomous categories.

Table 1. EM in SMEs

A) Integration of environment in organization's strategic management and planning process	Theoretical background
EM.1 Implementation of EM System	Aragón-Correa (1998); Armas-Cruz (2011); Benito-Hernández *et al.* (2016); Christmann (2000); Curkovic and Sroufe (2016); Deng *et al.* (1992); González-Benito, J. and González-Benito, O. (2005); Hart (1995); Hart and Ahuja (1996); Henriques and Sadorsky (1996); Hunt and Auster (1990); Judge and Douglas (1998); Kirk (1995, 1998); Klassen and Whybark (1999); Kleiner (1991); López-Gamero *et al.* (2009); López-Gamero and Molina-Azorín (2016); Martín-de Castro *et al.* (2016); Oreja-Rodríguez and Armas-Cruz (2012); Peattie and Ringler (1994); Russo and Fouts (1997); Sharma (2000); Wight (1994); Wolters *et al.* (1997).
EM.2 Implementation of Code of Good Practices	
EM.3 Environmental criteria in investments/purchases	
B) Prevention (of environmental impact)	
EM.4 Prevention of environmental accidents	
EM.5 Collaboration in promotion of culture and socioeconomic development of area	
C) Control (of environmental impact)	
EM.6 Saving natural resources and preserving their quality	
EM.7 Reduction of waste and use of polluting and/or dangerous substances	
EM.8 Control of regulations	
EM.9 Adequate management of waste and dangerous substances	
EM.10 Reduction of emissions, discharges, visual impact and noise	
D) Environmental communication and training	
EM.11 Training and motivation of staff in environmental objectives	
EM.12 Communication of EM to stakeholders.	

Scale: 1 = Not applied; 2 = Under development; 3 = Applied; 4 = Don't know/No answer.

Additionally, to evaluate the business resources employed, the questionnaire includes two relative questions, firstly regarding the volume of economic, human and technical resources employed and, secondly, concerning the volume of investment in the field of environmental protection.

3.2. Study population and sample

The study population comprises 6,824 firms established in Canary Islands, with a number of employees between 10 and 250 (updated from SABI[1]). Simple, stratified random sampling was applied with mixed proportionality, taking as strata the codes of the National Classification of Economic Activities (CNAE). Data gathering was performed via a telephone survey to the manager of the firms. The methodological characteristics of the empirical study are summarized in Table 2.

Table 2. Specifications of the empirical study

Universe	Small and medium-sized enterprises (10–250 employees)
Population	6,824 SMEs from Canary Islands
Final size of the sample	459
Sample error (level of confidence)	+/– 4.68% (95%; p = 0.5)
Date of fieldwork	First quarter of 2015
Treatment of the information	SPSS 21 and Winsteps, 3.80.1

3.3. Data analysis

459 questionnaires were obtained, completed by directors of SMEs belonging to the following sectors: industry (33%), construction (21%), hospitality (10%), transport (9%) and others –including distribution and retail- (27%). The sample comprises 71% of small firms (10–49 employees) and 29% of medium-sized enterprises (50–250 employees).

To analyze the data, Rasch Measurement Theory (RMT) (Rasch 1960; Wang 2010) was used. RMT enables improved measurement of Strategic Management, complying with the requirements established by Barney *et al.* (2001, 2011), as well as with the outstanding methodological elements proposed by Godfrey and Hill (1995) and Boyd *et al.* (2005). RMT applies demanding requirements in the process of questionnaire optimization and the subsequent analysis of reliability and overall validity of the measurements obtained (Sarstedt *et al.* 2015). Secondly, a cluster analysis identifies homogenous groups in the sample.

[1] System of Analysis of Iberian Balance Sheets (SABI): Financial database of Spanish and Portuguese firms, obtained from official sources. Supplier: INFORMA D&B S.A (https://www.einforma.com/sabi).

4. Results

4.1. Overall reliability of separation and validity of measures

As a prior step, an analysis was made of the data to eliminate the responses which may distort the measurement of EM in SMEs in the sample. Following this debugging of the questionnaire, a sample of 412 SMEs was obtained with which the parameters were estimated, using the maximum likelihood method. The results are summarized in Table 3.

Table 3. Statistics of EM factors

	Measure		INFIT MNSQ		OUTFIT MNSQ		Separation (Model)	Reliability
	Mean	S.D.	Mean	S.D.	Mean	S.D.		
SMEs	0.69	1.49	1.01	0.34	0.91	0.52	1.53	0.70
EM items	0	1.37	1.00	0.13	0.91	0.25	9.15	0.99

The overall reliability of separation and adjustment (validity) of the measures are confirmed. The validity can be seen in the analysis of the MNSQ infit and outfit values, which are situated within the accepted interval for the construction of measures, between 0.50 and 1.50 (Linacre 2002). Furthermore, the reliability of the measures obtained from the SMEs and the items reach values equal to or above 0.70. The variance explained indicates that the measures explain 40.5% of the variance of the data with an Eigenvalue in the first test equal to 2, which recognizes the unidimensionality of the scale.

These results demonstrate that the first objective has been achieved, confirming that the measures of the items of the construct 'EM of SMEs in a OERs are globally reliable and valid.

4.2. Hierarchization of the environmental protection practices

The second objective consists of obtaining a hierarchical list of the environmental practices of Canary Island SMEs, for which a joint positioning analysis of the items is performed using RMT (Engelhard 2013). The results confirm that the two strategies with the lowest measurements, that is to say the most frequent, are "Adequate management of waste and dangerous substances" (EM9) and "Training and motivation of staff in environmental objectives" (EM11). In turn, the environmental protection policies with the highest measurements, that is to say, those which are applied to a lesser degree by Canary Island SMEs, are "Control of regulations" (EM8) and "Implementation of EM System" (EM1) (see Rasch measure in Table 4).

Next, a frequency analysis determines what practices are more or less important, depending on the size of the firm and the sector. The result by sector via the frequency tables (Table 4) confirms that obtained previously using RMT. That is to say, EM9 is applied to the greatest extent (over 91%) in all sectors except transport, in which EM11 is the most frequent. By contrast, the "implementation of EM system" (EM1) is the least widespread in all sectors (under 50%), except in that of "transport and others", in which the least frequent practices are "reduction of waste and use of polluting and/or dangerous substances" (EM7) and "control of regulations" (EM8), respectively.

Table 4. Environmental practices applied by sector and size

	Rasch measure	Industrial	Construc-tion	Hospi-tality	Transport	Others	Small	Medium	Total
EM1	2.64	**46.7**	**44.7**	**50.0**	55.3	44.6	**42.0**	59.8	**46.8**
EM2	0.14	67.4	81.2	78.6	68.4	78.6	72.0	81.3	74.5
EM3	0.09	68.1	74.1	78.6	65.8	75.0	69.7	78.6	72.1
EM4	–0.20	78.5	77.6	73.8	76.3	75.9	74.0	84.8	76.9
EM5	–0.28	78.5	81.2	83.3	68.4	75.9	76.0	83.0	77.9
EM6	–0.58	83.0	89.4	92.9	84.2	75.9	81.7	88.4	83.5
EM7	1.81	56.3	58.8	59.5	**44.7**	47.3	46.3	73.2	53.6
EM8	1.94	51.9	48.2	52.4	47.4	**38.4**	42.7	**58.9**	47.1
EM9	–1.94	**95.6**	**91.8**	**97.6**	84.2	**91.1**	**91.7**	**95.5**	**92.7**
EM10	–1.15	88.9	80.0	95.2	86.8	78.6	82.3	91.1	84.7
EM11	–1.37	91.1	78.8	95.2	**92.1**	81.3	84.7	91.1	86.4
EM12	–1.10	85.2	90.6	92.9	73.7	78.6	83.3	86.6	84.2

The results were repeated by size. EM9 is applied to the greatest degree (over 91%) in both small and medium-sized businesses, while EM1 continues to be the least frequent practice in small firms and EM8 in those of medium size.

The column of totals shows that in Canary Island SMEs the degree of implantation of environmental policies is fairly optimal. The percentages exceed values of 70% in almost all the strategies of EM analyzed, except EM1 and EM8 (percentage of application lower than 50%).

4.3. Cluster analysis and ANOVA

The result of the two-phase cluster analysis (Hair *et al.* 1998) allows three segments of firms to be identified, which are characterized by their having a high (cluster 1), medium (cluster 2) and low (cluster 3) level of implantation and implication with EM (Table 5).

The ANOVA confirmed that significant differences exist among the three clusters delimited (confidence level of 99%). Likewise, confirmation is made of the correct association of the SMEs to the segment or cluster to which they belong on the basis of all the classification variables (rasch_EM, Rec, Inv and size). The only exception is the "sector" variable, indicating the type of sector to which the SME belongs, and is independent of the segment or cluster with which they are identified.

Having confirmed the heterogeneous character of the three segments of Canary Island SMEs, the next step is to analyze their differentiating characteristics to delimit the profile of each, thereby achieving our fourth objective.

Group 1, "Proactive" ("high level of implantation of EM") comprises 164 firms (39.8% of the total). In all the classification variables employed, the SMEs in this group present the highest values, for both the measurement of EM (rasch_EM) and for resources employed (rec) and investment level (inv). It is the group with the greatest proportion of medium-sized enterprises (34.1%). The main sector in this group is industry (34.1%).

Table 5. Profiles of the variables defining the clusters

Variable	Item	Cluster 1 40%	Cluster 2 46%	Cluster 3 15%
rasch_EM	[a] EM	3.6	0.5	–1.5
rec	[b] Volume of economic, human and technical resources currently assigned to environmental protection	3.5	2.9	2.4
inv	[b] Importance of investments for environmental protection with regard to the total volume of assets of the company	3.4	2.9	2.3
Size	Small	66%	77%	80%
	Medium	34%	23%	20%
sector	Industrial	34%	34%	25%
	Construction	18%	24%	15%
	Hospitality	13%	7%	10%
	Transport	9%	9%	12%
	Others	25%	26%	38%
certification	*Possesses or is the process of gaining:*			
	ISO 14001 Certificate	54%	20%	12%
	EMAS	2%	–	2%
	Other accreditation of environmental quality	10%	9%	10%
	Does not possess any accreditation	34%	71%	77%

Nores: [(a)] Variable resulting from the transformation of the EM items with RMT; [(b)] Variables measured with a Likert scale (1 = none 5 = much).

The majority in this group (66.5%) possess some type of accreditation of environmental quality, with 56.1% possessing EM systems certified with ISO 14001 (54.3%) or EMAS (1.8%).

Group 2, "Compliance" ("average level of implantation of EM") is the largest (188 SMEs, 45.6% of the sample). It is characterized by the EM measurement variables of resources employed and of the amount of environmental investment, which reach average values with regard to the three groups of SMEs delimited. This group increases the proportion of small SMEs (76.6%) compared to group 1 whereas its distribution by sectors proves to be very similar. The level of accreditation is medium-low, with only 29.3% of SMEs possessing some type of certification, those that do (20.4%) hold an ISO 14001, no firm certified with EMAS is present.

Group 3, "Reactive" ("low level of implantation of EM") is the smallest group (60 SMEs, 14.6% of the total). It presents lower values in the measurements of the grouping variables, which suggests that it comprises SMEs with similarly low implication in EM practices. 80% of firms are small (under 50 employees) and belong in their majority to the distribution and retail sectors. Only 13.4% of these SMEs possess an ISO 14001 (11.7%) or EMAS (1.7%) certificate, while 76.7% state they do not possess nor are they in the process of possessing any other type of environmental accreditation.

5. Discussion

Findings obtained make a relevant contribution in line with the gaps highlighted by previous literature.

Firstly, there is the progress in measuring constructs in Strategic Management and the NRBV, according to Barney *et al.* (2001, 2011). The application of RMT stands out in particular in the measurement of intangible resources. We confirm the overall validity and reliability of the measures obtained for the level of implantation of EM in Canary Island SMEs (first objective). It has also established a premise of the quality guarantee for subsequent results (Aragón, Iturrioz 2016), thus reinforcing its applicability in similar territories.

The second objective consisted of determining the importance of the policies representing the EM of SMEs. The practices most widely applied are the correct management of waste and dangerous substances and the training and motivation of personnel to achieve the environmental objectives. The least frequent strategy is the implantation of a formalized EM system, which involves a permanent allocation of resources that SMEs do not usually have available, as shown in the literature review. In this ranking, there are no substantial differences between medium-sized and small firms, while for sectors, consistent with Banerjee (2002), relatively less regulated services display lower levels of corporate environmentalism (transport, distribution and retail).

The third objective confirms the existence of three levels of environmental commitment clearly differentiated in Canary Island SMEs, described as: "Reactive" – cluster 3 – (lowest commitment); strategic attitude of cluster 2 would be defined as 'Compliance' (prevention of pollution), while cluster 1 "Proactive" (highest level of environmental commitment), whose firms employ the greatest volume of resources in EM. While "Compliance" responds to external pressures (stakeholders), "Proactive" responds to internal motivations and EM is integrated into its strategic planning and designed on the basis of resources and capacities (López-Gamero, Molina-Azorín 2016). According to NRBV, the delimitation of this typology is crucial to identify the resources and dynamic capabilities that can transform environmental challenges into sources of competitive advantage (Hart, Dowell 2011).

The smallest firms (mainly present in clusters 2 and 3) have the lowest levels of EM, in accordance with Brammer *et al.* (2012).

Figure 1 summarizes the strategic configuration of EM in the sample.

This study covers a wide spectrum of sectors, however the results indicate that differences in sectoral composition of delimited groups do not prove significant in their approach to EM. Nevertheless, a predominance of medium-sized enterprises exists as opposed to small firms in the 'Proactive' cluster. In line with the literature, this indicates the incidence of firm size on level of environmental responsibility (Nybakk, Panwar 2015) and implies a significant contribution to the gap in previous research about considering the heterogeneity of small and medium-sized firms (Brammer *et al.* 2012).

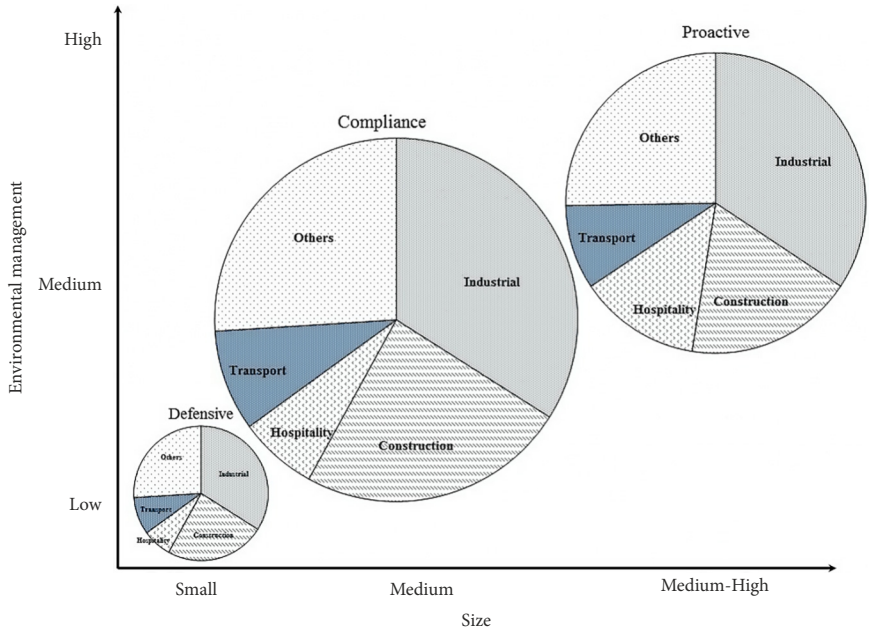

Fig. 1. Strategic EM typologies

Conclusions

In addition to the necessary analysis of SMEs in the particular context of an insular peripheral territory, this paper contributes to prior research findings in several ways. Firstly, progress has been made in measuring unobservable constructs in Strategic Management and the NRBV, particularly intangible resources and capabilities. "EM" in Canary Island SMEs has been validated and RMT methodology also guarantees the applicability of this construct for the analysis of other similar territories. This empirical application reinforces the prior scarce use of RBT in research into CRS in SMEs.

Furthermore, it has been delimited SME's internal dynamics to develop value-creating responsible strategies. We confirm that SMEs in this OER have a satisfactory level of environmental commitment, with practices of prevention and control of impact predominating. Specifically, most widely applied practices are the management of waste and dangerous substances and the training and motivation of personnel. These two aspects do not demand excessive resources and guarantee SMEs' compliance with the legislation in force as regards waste and discharges. However, SMEs still have much room for improvement in integrating EM in strategic planning by incorporating standardized environmental systems in line with the limitations of the context of the OERs, where costs of distance and insularity limit even further the availability of necessary resources for SMEs to implant such rigorous standards.

According to above, another important contribution to NRBV is the identification of best positioned firms to develop that "green" dynamic capabilities with the potential to generate competitive advantage. A typology of environmental strategies which charac-

terize SMEs' behavior in this OER have been identified as "Reactive", which groups together firms that elude to a maximum extent their environmental responsibility, attempting to delay the incorporation of these aspects into their management criteria and dedicating the lowest investment of resources; "Compliance", focused on the prevention of environmental impact; and "Proactive" comprises those firms who develop much further their EM with the perspective of the opportunity of attaining competitive advantages, thereby adopting a position of environmental leadership.

From both scientific and managerial perspectives, the analysis of this proactive group is crucial to advance the knowledge of the resources and capabilities that can generate a sustainable competitive advantage. According to that, by analyzing different productive sectors (industry, construction, hospitality, transport, distribution and retail, where the services sector accounts for 46% of the sample, conveniently reflecting the business fabric of insular OERs), we could verify that, in this sample of SMEs, there are no differences in the environmental strategic position due to sectoral specificities. However, firms' size is determinant in strategic management of environment, since "Proactive" firms are mainly medium-sized. The smallest firms' EM is oriented towards operational and not strategic elements due to the perception of small firms that such management does not provide them with opportunities to generate competitive advantages. These findings permitted us to contribute to the gaps highlighted by previous literature with respect to explore the heterogeneity of EM between small and medium-sized firms, and the necessary comparison between business sectors.

In summary, this paper contributes from the point of view of NRBV and in both political and managerial planning processes in OERs. Future research should advance the delimitation of social-environmental capabilities that have potential to generate competitive advantages by comparing other OER and to advancing from cross sectional to longitudinal analysis.

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