

Are environmental strategies profitable for companies? The key role of natural competences from a resource-based view

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Abstract

Purpose – The purpose of this paper is to investigate the relationship between proactive environmental strategies (PES) and economic performance from a resource-based view. The authors determine the nature of this relationship and the processes and conditions that are involved. The mediating role of natural competences is a major focus, particularly the effect of their simultaneous development on economic performance.

Design/methodology/approach – The authors use structural equation modeling on a sample of 188 companies from the food-processing and household products industries in France.

Findings – The results confirm the positive impact of PES on economic performance. Unlike the natural competences individually, the simultaneous development of these competences mediates the relationship. The results also highlight the influence of conventional competences on economic performance and the impact of organizational and procedural competences on the level of simultaneously developed competences.

Practical implications – The study demonstrates the economic benefits of PES to practitioners. Moreover, it provides them the information on the key role of natural competences and how they can be developed to make PES profitable.

Originality/value – The findings support a “win-win” view of the PES-economic performance relationship, whereas prior studies showed contrasting evidence. The main contribution lies in the consideration of natural competences in this relationship and in their operationalization.

Keywords Competences, Financial performance, Environmental management strategy, Resource management

Paper type Research paper

1. Introduction

Proactive environmental strategies (PES) are considered urgent, profitable and sustainable ways for firms to deal with the natural environment (Aragón-Correa and Rubio-Lopez, 2007; Clarkson *et al.*, 2011; Darnall *et al.*, 2010). Aragón-Correa and Sharma (2003, p. 73) defined PES as “proactive postures to anticipate future regulations and social trends [...] to prevent (rather than merely ameliorate) negative environmental impacts.” Scholars have given attention to the economic impact of PES for several years now (Ambec and Lanoie, 2008; Chen *et al.*, 2016; Horvathova, 2010; Molina-Azorin *et al.*, 2009). Some have concluded that PES are a source of additional costs that harm competitiveness (Hull and Rothenberg, 2008), whereas others see PES as ways to boost economic performance and enhance corporate profitability (Ambec and Lanoie, 2008; Porter and Van der Linde, 1995). Still others have shown the embarrassing counterproductive effect of these strategies on the natural environment itself (Aragón-Correa and Rubio-Lopez, 2007; Aragón-Correa *et al.*, 2016). There are two likely reasons for these discrepancies and they are thus the starting point of our study and the bases for our contributions.

First, according to the “natural” resource-based view (Hart, 1995; Journeault, 2016; Qiu *et al.*, 2016), a positive link between PES and economic performance results from the creation and use of unique “natural competences,” without which proactive strategic



intentions would be pointless (Aragón-Correa and Rubio-Lopez, 2007; Arend, 2014; Malik, 2015; Wong *et al.*, 2012). Our study thus investigates the mediating role of natural competences (Hart, 1995; Buysse and Verbeke, 2003) and their individual and simultaneous effects on economic performance. We thereby extend the related literature that has not always taken full account of the essential condition for a company's financial success: optimal use of its capabilities (Flammer and Kacperczyk, 2015; Torugsa *et al.*, 2012).

Second, from an empirical viewpoint, the discrepant results on the PES-economic performance link are in part due to the heterogeneity of the methods and the variables under study (Clarkson *et al.*, 2011; Horvathova, 2010; Molina-Azorin *et al.*, 2009). Our study thus clearly defines and operationalizes the selected variables, describes the research process in a transparent and detailed way and addresses some of the inherent biases (identification of mediatory linkages, common method bias, etc.). Notably, we advance progress on operationalizing Hart's (1995) "natural competences" by expanding on the work of Buysse and Verbeke (2003).

Our study thus investigates the relationship between PES and economic performance from a resource-based view. We determine the nature of this relationship and the processes and conditions that are involved. The mediating role of natural competences is a major focus, particularly the effect of their simultaneous development on economic performance. To this end, we therefore use structural equation modeling (SEM) on a sample of 188 companies from the food-processing and household products industries in France. Our results confirm the positive impact of PES on economic performance. Unlike the natural competences individually, the simultaneous development of these competences mediates the relationship. The results also highlight the influence of conventional competences on economic performance and the impact of organizational and procedural competences on the level of simultaneously developed competences.

We thus contribute to the ongoing debate on the business case for environmental strategies (Chen *et al.*, 2016; Gelhard and Von Delft, 2016). More specifically, we demonstrate that companies can be green and profitable at the same time (Devinney, 2009; Porter and Van der Linde, 1995): indeed, they are likely to be successfully competitive – "doing well" – by "doing good" for the natural environment (Garzella and Fiorentino, 2014). We thus support a "win-win" view of the PES-economic performance relationship, whereas prior studies showed contrasting evidence.

First, our study of the individual and simultaneous mediating effects of natural competences reveals that they need to be accumulated to ensure high economic performance. We thus extend the studies that have linked PES and economic performance without focusing on these mediatory linkages (Horvathova, 2010; Lee *et al.*, 2016). From a more methodological perspective, our study clarifies the definition and further operationalizes PES and the five natural competences introduced by Hart (1995) and Buysse and Verbeke (2003). We also present a rigorous empirical design to identify the mediatory linkages from PES through the natural competences to economic performance. Last, we believe that managers will find our results useful in guiding their choices of green management practices and leveraging green management resources to boost economic performance.

This paper is structured as follows. We present our research framework, which is embedded in a resource-based view, and our research hypotheses. We then present our methodology for operationalizing the concepts (construction and validation of measurement scales) and testing our hypotheses through SEM. Last, the third section presents our results and the discussion.

2. Natural competences at the very heart of the business case for PES

2.1 A resource-based view

According to the resource-based view, corporate performance is directly explained by the possession of strategic resources, characterized by value, scarcity, inimitability and

non-substitutability (Barney, 1991). These resources may be tangible or intangible assets that a company combines to build competitive advantage. Different ways of classifying resources have been advanced. Grant (1991) distinguished tangible resources like financial resources, production equipment, fixed assets and inventories; intangible resources like reputation, technology and human resources; and the resources of competences and know-how like culture, training and the expertise, and employee commitment and loyalty. Teece *et al.* (1997) distinguished eight categories: technology, knowledge, media, finance, reputation, structure (or governance), institution and market and network resources. Firms that possess, combine and exploit these resources are expected to generate economic rents (Barney, 1991; Peteraf, 1993) by taking advantage of market opportunities or neutralizing threats (Barney, 1991). The company is regarded here as a portfolio of resources that serve as supports for products and business activities (Hamel and Prahalad, 1994).

Yet, although performance differences are directly explained by firm heterogeneity in resource possession (Arrègle, 1996), the value of any given resource is very much determined by its match with market forces and its context (industry, period) (Collis and Montgomery, 1995). Traditionally, the resource-based view has mostly considered the political, technological, economic and social dimensions of the environment, omitting its natural dimension in the analyses of market forces (Shrivastava and Hart, 1994).

Hart (1995), however, extended the resource-based view to include the opportunities and constraints linked to the natural environment. He especially saw the potential for companies to develop portfolios of strategic natural competences and thus offered several areas of expertise within which they could consider actions that would be more respectful of the environment. He reiterated the need to build competitive advantage through social and environmental performance and saw stakeholder expectations for corporate responsible behaviors as a source of market opportunity (Wagner, 2015). Hart's (1995) work was expanded by Buysse and Verbeke (2003), who grouped his natural competences into five categories: conventional, human, organizational, procedural and strategic planning[1] competences:

- (1) conventional competence refers to the physical resources implicated in the offer of more environmentally friendly products: technology, plants, equipment, raw materials, etc. (Buysse and Verbeke, 2003);
- (2) human competence refers to employee qualifications, training and participation in relation to the natural environment (Bowen and Sharma, 2005; Buysse and Verbeke, 2003; Hart, 1995; Paillé and Raineri, 2015);
- (3) organizational competence refers to sustainability as part of the corporate structure: hierarchical structure, coordination, degree of centralization, allocation of missions and responsibilities related to sustainable development, etc. (Buysse and Verbeke, 2003; Hart, 1995);
- (4) procedural competence refers to standardized and formalized procedures for responding to sustainability issues and reporting systems (auditing, certification, assessment, etc.) to continuously reduce environmental impact (Buysse and Verbeke, 2003; Darnall *et al.*, 2010); and
- (5) strategic planning refers to precisely defined objectives for sustainability formalized through a plan: well-defined objectives, budgets and steering committees (Buysse and Verbeke, 2003; Hart, 1995; Henriques and Sadorsky, 1999).

The influence of natural competences or capabilities in building competitive advantage (though innovation, differentiation, etc.) through environmental engagement has been highlighted in recent studies (Flammer and Kacperczyk, 2015; Journeault, 2016; Wong *et al.*, 2012). However, other studies have shown that acquiring these competences is

not within the reach of all companies. An important condition is a proactive commitment to take into account the natural environment (Malik, 2015; Torugsa *et al.*, 2012). Without the willingness or intention to include environmental concerns in corporate strategy and to make the corresponding investments (Singh *et al.*, 2016), it is unlikely that companies can develop significant competences in this field.

Therefore, it follows that only companies demonstrating a proactive and sustained commitment are likely to acquire this unique expertise (Aragón-Correa and Rubio-Lopez, 2007; Clarkson *et al.*, 2011; Darnall *et al.*, 2010). In this regard, PES are based on strong commitment to protecting the environment and a shared vision of the future that enable companies to leverage resources and invest in each of these five categories of competence (Hart, 1995; Verbeke *et al.*, 2006). The business case for the natural environment is thus made by proactive companies that have acquired the necessary skills for transforming the market forces related to the natural environment into competitive opportunities (Albort-Morant *et al.*, 2016; Aragón-Correa and Rubio-Lopez, 2007; Arendt, 2014; Malik, 2015).

Our study is in line with those studies that have sought to demonstrate that it pays to be green (Clarkson *et al.*, 2011). However, to address the issue of contrasting evidence, we propose to put natural competences at the very heart of the conditions needed to achieve a green competitive advantage (Porter and Van der Linde, 1995).

2.2 Hypothesis development

As defined in our theoretical framework, PES is the willingness to integrate environmental responsibilities into business objectives and missions (Arendt and Brettel, 2010). PES thus reflects “strategic intent” (Hart, 1995) with top managers encouraging and supporting environmental initiatives and actions beyond mere adaptation to regulatory constraints or stakeholder pressures (Huang, 2016; Lee, 2011; Menguc *et al.*, 2010). The natural environment is at the very heart of the corporate mission and is perceived as an opportunity for long-term corporate development (Sharma and Vredenburg, 1998). This type of environmental strategy embraces the redefinition of products, processes, technologies and even business models to anticipate projected changes in external regulations and social trends (Torugsa *et al.*, 2012). Strategy scholars have described this kind of engagement – that is, taking on leadership in the field – as the search for competitive advantage through the consideration of the natural environment (Delgado-Ceballos *et al.*, 2012; Bansal and Song, 2017).

Although research on the business case for PES is fairly voluminous, debate nevertheless continues on the nature of the relationship between PES and economic performance (Ambec and Lanoie, 2008; Chen *et al.*, 2016; Horvathova, 2010; Molina-Azorin *et al.*, 2009). Some researchers hold that investment in sustainability is against-productive or a source of additional costs, whereas others see sustainable behavior as a means to generate savings due to more efficient management of environmental issues (Zou *et al.*, 2015). A third perspective defines environmental strategy as a way to not only reduce costs (competitive cost advantage), but also create a surplus of value through enhanced image or product and service innovation (competitive advantage by differentiation), thereby improving competitiveness (Albort-Morant *et al.*, 2016; Arendt and Brettel, 2010; Lloret, 2016). Although these empirical studies are very heterogeneous in terms of concepts, measures and methodologies and their results are mixed (Horvathova, 2010; Molina-Azorin *et al.*, 2009), most – between 50 and 70 percent of the studies taken into account in the meta-analyses of Molina-Azorin *et al.* (2009) and Horvathova (2010) – nevertheless conclude to a positive relationship between ambitious corporate environmental strategies and corporate economic performance. We thus present the following hypothesis:

H1. PES have a positive influence on economic performance.

Through PES, top managers formalize their commitment to the natural environment with ambitious sustainability policies (Rondinelli and Vastag, 2000; Bansal and Song, 2017), the

establishment of formal long-term objectives and detailed business plans (Hart, 1995; Delgado-Ceballos *et al.*, 2012). PES that are based on strong commitment to the natural environment and a shared vision of the future enable companies to leverage resources and invest in each of these five categories of competence (Hart, 1995; Verbeke *et al.*, 2006). A portfolio of specific competences can thus emerge, primarily characterized by a proactive set of management practices (Gonzalez-Benito and Gonzalez-Benito, 2005; Hart, 1995; Russo and Fouts, 1997). The description of how PES are is assumed to be positively associated with each natural competence is described in Table I.

We therefore present the following hypothesis:

H2. PES have a positive influence on the development of natural competences.

As noted, these competences are a way for companies to build a competitive advantage around the natural environment (Clarkson *et al.*, 2011; Hart, 1995). More importantly, they are likely to support differentiation strategies (conventional, procedural, organizational and strategic planning competences), improve corporate process efficiency (human, organizational and procedural competences), provoke questioning of existing processes that may change the rules of the competitive game (conventional, human and strategic planning competences), and/or encourage better communication with internal and external stakeholders, thereby boosting corporate reputation (conventional, procedural and strategic planning competences) (Wagner, 2015). The description of how each natural competence is assumed to be positively associated with economic performance is presented in Table I. We thus present the following hypotheses:

H3. Natural competences have a positive influence on economic performance.

H4. Natural competences mediate the relationship between PES and economic performance.

Moreover, Hart (1995) focused on the progress of companies along the continuum of environmental strategies and stressed the need for comprehensive portfolios of

Natural competences	Impact of PES on natural competences	Impact of natural competences on economic performance
Conventional competence	Willingness to design products and production processes to minimize environmental impacts throughout the life cycle (Bansal, 2005)	Boost innovation processes and the development of new technologies. Opportunity of differentiation through products (Bansal, 2005)
Human competence	Inclusion of sustainability principles in all aspects of the HR policy (culture, recruitment, career, etc.) (Paillé and Raineri, 2015; Starik and Rands, 1995)	Facilitate attraction and retention of talent. Positive effect on productivity and efficiency (Paillé and Raineri, 2015; Starik and Rands, 1995)
Organizational competence	Creation of functions and transversal/cross-functional networks supporting sustainability issues (Buysse and Verbeke, 2003; Hart, 1995)	Accumulate complex social resources, boost communication between services/ stakeholders and support innovation throughout the organization (Bowen and Sharma, 2005; Welford, 1993)
Procedural competence	Implementation of ongoing monitoring and assessment of processes linked to sustainability and communication/reporting procedures (Bansal, 2005; Hart, 1995)	Develop an internal evaluation culture boosting efficiency and effect on reputation and differentiation (Darnall and Edwards, 2006; Welford, 1993)
Strategic planning competence	Ambitious and long-term vision for sustainability – formal objectives and detailed business plan (Rondinelli and Vastag, 2000; Hart, 1995)	Change the rules of the game, initiation of disruptive strategies, smooth management of stakeholders and innovation (Buysse and Verbeke, 2003; Sharma and Vredenburg, 1998)

Table I.
Hart (1995)'s five natural competences and relationships with PES and economic performance

simultaneously developed competences to ensure environmentally oriented practices and performance. From this perspective, building a portfolio of natural competences is a process characterized by path dependency and embeddedness (Hart, 1995; Torugsa *et al.*, 2012). First, competences are expected to develop and accumulate progressively and, second, it might be difficult to develop a given competence without investing similarly in other competences of the same nature (e.g. “natural competences”). According to Hart (1995), shared vision (defined as a general commitment to sustainability and environmental responsibility) and overall strategic plans (implementation of programs and projects over time) help to focus and accelerate the accumulation and simultaneous construction of natural competences. In this vein, Verbeke *et al.* (2006) underlined the influence of governance structures and the importance of top managers’ support in making simultaneous investments across the portfolio of natural competences. These findings lead us to formulate the following hypothesis:

H5. PES has a positive influence on the simultaneous development of all natural competences.

Scholars have noted that a company’s ability to invest simultaneously in natural competences is likely to result in sustainable competitive advantage (Buisse and Verbeke, 2003; Hart, 1995; Verbeke *et al.*, 2006; Singh *et al.*, 2016). Indeed, simultaneous investment increases the ability to coordinate, integrate, transform and reconfigure assets (Hart, 1995; Sharma and Vredenburg, 1998; Verbeke *et al.*, 2006), paving the way for the emergence of dynamic capabilities (Gelhard and Von Delft, 2016; Helfat *et al.*, 2007; Judge and Elenkov, 2005; Li and Liu, 2014) and innovative practices (Helfat *et al.*, 2007). It is thus likely to generate combinations of knowledge and competences, individual or collective, through various company processes (production, distribution, decisions, communication, etc.). In addition to developing natural competences *per se*, the company might explore the creation of new competences by recombining, renewing, assembling or reconfiguring the existing competences (Russo and Fouts, 1997). Thus, simultaneous investment across the portfolio of natural competences – through its impact on dynamic capabilities – significantly contributes to corporate competitiveness, particularly in terms of differentiation, cost reduction, reputation and/or product quality (Buisse and Verbeke, 2003; Gelhard and Von Delft, 2016; Judge and Elenkov, 2005; Li and Liu, 2014; Sharma and Vredenburg, 1998; Verbeke *et al.*, 2006). We therefore propose the following hypotheses:

H6. The simultaneous development of all natural competences has a positive influence on economic performance.

H7. The simultaneous development of all natural competences mediates the relationship between PES and economic performance.

3. Methodology

The objective of this paper is to investigate the relationship between PES and economic performance by taking into account the mediatory role of natural competences. As explained in our introduction, a clear and transparent methodological design is crucial to adequately address the criticisms of opacity in this field. Our design was especially conceived to avoid three common limitations in the existing studies (Molina-Azorin *et al.*, 2009): a lack of clarity in defining and operationalizing variables, a lack of attention to mediatory linkages and the persistent risk of common method bias.

3.1 Sample and data collection

We conducted this study on companies from the food-processing (food and beverages) and household products (cleaning, health and beauty) industries, collectively referred to as FB

and HP. The companies are particularly well-known in France for substantially integrating sustainability issues into their activities. Over the past 50 years, these industries have grown considerably (Gherzi and Rastoin, 2010) and undergone striking changes in their distribution structure (dominated by supermarkets and hypermarkets), packaging consumption (this sector alone consumes over 75 percent of packaging produced per year, with the freedom to choose packaging formats since 2006), consumption patterns (nomadic and individual consumption, reduced household sizes) and regulatory pressures[2] (French and European), all of which have pushed them to address environmental issues (in terms of structuration, regulatory constraints and potential opportunities). The FB & HP industries thus seemed well-suited to our research objectives.

Our sample was built from companies in the 2009 Diane[3] database, coded 10 (food industry), 11 (beverage manufacturers) or 204 (soaps, cleaning products and perfumes). We obtained a workable list of 1,510 companies. All were approached for contact information on those in charge of sustainability issues. A total of 1,034 companies agreed to participate in the study and gave their e-mail addresses to receive an e-mail providing access to the online questionnaire. At the end of the study, 188 usable questionnaires were collected, for an overall return rate of 18.2 percent.

This response rate, which is within the usual range reported in the literature on this topic (Christmann, 2000; Wong *et al.*, 2012), raises the issue of non-response bias. To evaluate this bias, we tested for statistically significant differences between late recorded surveys and early recorded surveys (Armstrong and Overton, 1977; Lambert and Harrington, 1990), which is widely done in these kinds of situation (Arend, 2014). The final responses were the proxy for non-respondents and the early responses were the proxy for respondents. We used a *t*-test to assess the differences between the two groups and found no evidence of a non-response bias as the two groups showed non-significant differences in the survey items used in the analysis. Moreover, we addressed the issue of the representativeness of the responses received. We compared the distribution on some of the descriptive outcomes between our data and the population of the FB and HP industries. The distribution along age, activities and size from our data was very similar to that of the initial population. For example, about 60 percent have total sales of less than 50 million euros (vs 64 percent in the initial population).

3.2 Measures

PES. To measure PES, we built a multi-item tool rated on a bipolar seven-point scale. This measure was based on the literature findings (Buysse and Verbeke, 2003; Menguc *et al.*, 2010) and a phase of preliminary qualitative analysis conducted between 2004 and 2007[4]. In this initial step, the first tool was built and pre-tested by three sustainability managers from FB and HP companies and three expert-faculty members. No modifications were recommended. The result was an initial eight-item scale (see Table A1).

Natural competences. To measure the natural competences, we built a multi-item tool for each of Hart's (1995) five natural competences on the basis of scales proposed by Buysse and Verbeke (2003), Henriques and Sadorsky (1999) and Sharma and Vredenburg (1998). These measures were enriched and refined by a pre-test conducted with experts[5].

Simultaneous development of natural competences. The level of simultaneous development of the natural competences (coded SIMCOMP) included both the degree and the similarity of investment across the competence categories. This variable was calculated as follows:

$$\text{SIMCOMP} = (\text{SD}_{\max} - \text{SD}_i) \times \text{Mean}_i$$

where SD_i and Mean_i refer to the standard deviations and means of the natural competences for each individual company, respectively and SD_{\max} refers to the maximum

standard deviation of all the individual companies in the database. Thus, SIMCOMP increased with the mean value of all the natural competences (degree of investment in competences) and with the decrease in the investment gap between the different competences (simultaneous development).

Economic performance. To operationalize economic performance, we used three complementary measures of profitability based on accounting data and frequently employed in this type of research: (Choi and Wang, 2009; Hart and Ahuja, 1996): return on assets[6] (ROA, or economic profitability), return on sales[7] (ROS, or commercial performance) and return on equity[8] (ROS, or financial profitability). This choice of indicators provides a well-known measure, both comparable and multidimensional, to assess corporate competitiveness. Stock market measures (Godfrey *et al.*, 2009) were excluded because of their inability to measure the performance of unlisted companies, which composed most of our sample. In addition, to avoid common method bias, the performance data were collected from corporate accounting documents (secondary data), whereas data for PES and the natural competences were collected using perceptual measures (primary data). For each company, we used the average values of these ratios for the years 2009-2011.

Control variables. We included several control variables likely to impact corporate economic and financial performance: a measure of financial risk coded RISK[9] (Hull and Rothenberg, 2008), a measure of corporate size coded SALES[10] (Darnall *et al.*, 2010), and a measure of corporate research and development (R&D) and innovation (McWilliams and Siegel, 2000; Hull and Rothenberg, 2008) coded RD[11]. We also used growth as a control variable, as the average of annual sales growth over the last three years.

3.3 Statistical methods

The Statistical Package for the Social Sciences (SPSS 18.0) and AMOS 18.0 were used for our statistical analyses. The properties of the PES and natural competence constructs in the proposed model were tested using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The conceptual model was designed to measure causal relationships among hypothetical constructs established according to the literature. SEM procedures tested the hypothesized relationships.

3.4 Assumptions tests

We examined the basic assumptions of the data to make sure that they met the requirements for SEM techniques. We first checked for univariate outliers. Standardized values of all variables were between -3.29 and $+3.29$, so there were no univariate outliers. Then we checked for univariate normality. Linearity scatter plots revealed normal data patterns in all randomly selected variables. The range of skewness and kurtosis suggested a normal distribution of the data, with all values within $[-2; +2]$ for skewness and $[-7; +7]$ for kurtosis (Byrne, 2010). Last, we evaluated multivariate outliers with the Mahalanobis distance calculation. The distances had to be under the χ^2 critical value with the number of variables as the degrees of freedom and $p < 0.001$. We used 27 variables so the Mahalanobis critical value was 55.47. There was no Mahalanobis distance value that was greater than 55.47 from any of the study data. The distance for each variable had met multidimensional requirements (Byrne, 2010).

3.5 Psychometric properties of measures

PES. We conducted EFA (with SPSS 18 software) followed by CFA (with AMOS 18 software). In the construction of the measurement scales, the combination of exploratory and confirmatory methods is the most widely used to assess scale reliability and validity (Hinkin, 1995).

EFA was conducted using principal component analysis (PCA) as the extraction method and varimax as the rotation method. We first checked the relevance of PCA using Bartlett's sphericity test, the Kaiser-Meyer-Olkin (KMO) test and the measure of sampling adequacy (MSA) test. The KMO MSA was acceptable at 0.92. Bartlett's test of sphericity was also significant at $p < 0.001$ with χ^2 value of 749.01. The representativeness of each item was next assessed using the purification criterion. The analyses indicated a six-item scale as most appropriate as we eliminated indicators that had loading values below 0.6.

We then performed CFA with SEM using AMOS to test the overall fit of the measurement model (using absolute fit indicators: χ^2/df (NC), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), standardized root mean squared residual (SRMR); comparative indicators: normed fit index (NFI), relative fit index (RFI); and indicators of model parsimony: consistent Akaike information criterion (CAIC), expected cross-validation index (ECVI)). This led us to retain a five-item scale for the best fit (in terms of absolute indicators (NC = 1.517, GFI = 0.988, AGFI = 0.955; SRMR = 0.024), comparison indicators (NFI = 0.988; RFI = 0.97), and parsimony indicators (CAIC and ECVI have a lower value than the saturated model)). Factor loadings ranged from 0.73 to 0.89. Regarding the convergent validity, the t -test associated with each factor contribution was significant ($RC > 1.96$), the square of each factor contribution was greater than 0.5, and the average variance indicator (average variance extracted (AVE)) was greater than 0.5. In addition, for each of the four dimensions, factor contributions showed that each indicator shared more variance with the latent variable than with the error term. Last, in terms of reliability, Joreskog's ρ was very satisfactory, greater than 0.8, and the Cronbach's α was greater than 0.88 (see Table AI), above the acceptable threshold of 0.7.

Natural competences. We successively ran EFAs and CFAs on all items of the natural competences. EFA was conducted using PCA as the extraction method and varimax as the rotation method. The KMO MSA was acceptable at 0.91. Bartlett's test of sphericity was also significant at $p < 0.001$ with a χ^2 value of 5,162.54. The representativeness of each item was next assessed using the convergent and discriminant validity criterion. After eliminating 15 items with low factor loadings that contributed to an unclear factor structure or with cross-loading issues, four factors consistent with the past literature emerged: conventional competence, organizational competence, human competence and procedural competence (see Table AII). With the elimination of these 15 items, it was impossible to maintain a dimension relative to strategic planning competence.

To confirm this factor structure, we used CFA to further refine the scales by eliminating some items on the basis of validity and reliability criteria. The measurement model we obtained was characterized by a very good fit (in terms of absolute indicators (NC = 0.827, GFI = 0.947, AGFI = 0.919, SRMR = 0.047); comparative indicators (NFI = 0.949; RFI = 0.931); and parsimony indicators (CAIC and ECVI have a lower value than the saturated model)). Indicator reliability of the reflective measurement model was given because item loadings were greater than the threshold of 0.7 (with loadings ranging from 0.71 to 0.94). Construct reliability of the reflective measurement model was tested by calculating Joreskog's ρ and Cronbach's α . These values were above 0.8 (see Table AII). Regarding convergent validity, the t -test associated with each factor contribution was significant ($RC > 1.96$), the square of each factor contribution was greater than 0.5, and AVE was greater than 0.5, indicating that 50 percent or more of the variance of the latent constructs was explained by the corresponding manifest items. This indicated that the latent variables reflected the variance of the manifest variables quite well. To test discriminant validity, the square root of AVE of each construct was compared with the latent variable correlations with respect to other latent variables (Fornell and Larcker, 1981). The AVE square root of every construct was greater than the correlations with all other

latent variables in the model, thereby upholding discriminant validity. This procedure yielded measures of conventional (coded FCONV), human (coded FHUM), procedural (coded FPROCESS) and organizational (coded FORGA) competences.

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3.6 Data analysis

To test our hypotheses, we used several structural equation models with AMOS 18. Given the good results of the measurement models, we used the aggregate scores to measure PES and the four natural competences (FCONV, FHUM, FPROCESS and FORGA), which reduced the complexity of the model and the specification problems (Calantone *et al.*, 1996).

To highlight the expected mediating effects and determine the model with the best fit, we developed four successive models, gradually integrating our variables and the links related to our hypotheses. Thus, in Model 1, we included the variables of PES, natural competences and performance to test *H1* on the relationship between PES and performance and *H2* on the relationship between PES and natural competences. In Model 2, and on the basis of Model 1, we tested *H3* on the relationships between the natural competences and performance and *H4* on the mediating role of the natural competences in the relationship between PES and performance. In Model 3, we added the variable of simultaneous development of all competences to test *H5* on the relationship between PES and the SIMCOMP, *H6* on the relationship between SIMCOMP and performance, and *H7* on the mediating role of SIMCOMP in the relationship between PES and performance. Last, in Model 4, control variables were integrated into Model 3. Table II shows the structural paths of the four tested models and their fit indices. Only significant relationships are reported.

Although all four models showed satisfactory fit, Model 3 presented the best fit and had the advantage of taking into account all our hypotheses. We present it graphically in Figure 1 to facilitate the reading of our results. Only significant relationships are reported.

4. Findings and discussion

Our results validate *H1* by showing a positive and significant relationship between PES and economic performance. We also validate *H2* proving that PES have a positive and significant influence on the development of natural competences. Regarding the mediatory role of natural competences, we partially validate *H3* concerning the positive influence of natural competences on economic performance (conventional competence is the only natural competence to positively and significantly impact profitability). Moreover, we do not validate *H4*, which tested the individual mediating effect of natural competences between PES and economic performance. However, we validate *H5*, *H6* and *H7* related to the simultaneous mediating effects of natural competences. We also discuss the role of size and innovation in our model.

4.1 PES and economic performance (*H1*)

The results validate *H1*. PES positively influences corporate economic performance by its direct effect on ROS and indirect effects on ROA and ROE (see Table II). This finding empirically confirms the results of some of the studies positively linking proactive strategic intent or an orientation toward the natural environment and economic performance (Sharma and Vredenburg, 1998). It also complements the studies linking environmental practices (Hart and Ahuja, 1996; Lo *et al.*, 2012) or environmental performance (Clarkson *et al.*, 2011; Dixon-Fowler *et al.*, 2013; Orlitzky *et al.*, 2003) with profitability.

The positive effect of PES supports the instrumental view of corporate environmental responsibility. Indeed, in addition to the normative approach of defending environmental engagement via value and institutional or legitimacy motives (e.g. Clarkson, 1995), top managers can also lend their support for instrumental reasons that are not necessarily in opposition to normative justifications. For example, PES has an impact on corporate

	Standardized coefficient
Structural paths (model 1 ELE ^a)	
PES→ROS	0.28***
PES→FHUM	0.80***
PES→FORGA	0.67***
PES→FCONV	0.68***
PES→FPROCESS	0.57***
ROS→ROA	0.34***
ROS→ROE	0.20**
Structural paths (model 2 ELE ^b)	Standardized coefficient
PES→ROS	0.20***
PES→FHUM	0.80***
PES→FORGA	0.67***
PES→FCONV	0.68***
PES→FPROCESS	0.57***
FCONV→ROS	0.11*
ROS→ROA	0.34***
ROS→ROE	0.20**
Structural paths (model 3 ELE ^c)	Standardized coefficient
PES→ROS	0.15**
PES→FHUM	0.80***
PES→FORGA	0.67***
PES→FCONV	0.68***
PES→FPROCESS	0.57***
FCONV→ROS	0.11*
PES→SIMCOMP	0.20**
SIMCOMP→ROS	0.25***
FORGA→SIMCOMP	0.35***
FPROCESS→SIMCOMP	0.42***
ROS→ROA	0.34***
ROS→ROE	0.20**
Structural paths (mod 4 ELE ^d)	Standardized coefficient
PES →ROS	0.15**
PES→FHUM	0.80***
PES→FORGA	0.67***
PES→FCONV	0.68***
PES→FPROCESS	0.57***
FCONV→ROS	0.11*
PES→SIMCOMP	0.20**
SIMCOMP→ROS	0.25***
FORGA→SIMCOMP	0.35***
FPROCESS→SIMCOMP	0.42***
ROS→ROA	0.34***
ROS→ROE	0.20**
SALES→FPROCESS	0.17**
SALES→FORGA	0.11*
SALES→PES	0.23***
RD→ROA	0.18**
RD→ROS	0.20**

Notes: ^aModel 1 has the following indices: $n=0.841$; $GFI=0.977$; $AGFI=0.959$; $SRMR=0.0455$; $NFI=0.968$; $RFI=0.955$; $CFI=1$; $CAIC=116$ vs 223 for the saturated model; $ECVI=0.267$ vs 0.393 for the saturated model; ^bModel 2 has the following indices: $NC=0.832$; $GFI=0.979$; $AGFI=0.959$; $SRMR=0.0426$; $NFI=0.970$; $RFI=0.955$; $CFI=1$; $CAIC=121$ vs 223 for the saturated model; $ECVI=0.272$ vs 0.393 for the saturated model; ^cModel 3 has the following indices: $NC=0.816$; $GFI=0.979$; $AGFI=0.956$; $SRMR=0.0400$; $NFI=0.976$; $RFI=0.958$; $CFI=1$; $CAIC=166$ vs 279 for the saturated model; $ECVI=0.356$ vs 0.492 for the saturated model; ^dModel 4 has the following indices: $NC=0.901$; $GFI=0.967$; $AGFI=0.941$; $SRMR=0.0497$; $NFI=0.957$; $RFI=0.935$; $CFI=1$; $CAIC=213$ vs 410 for the saturated model; $ECVI=0.499$ vs 0.721 for the saturated model. *, **, ***Significant at the 0.001, 0.01, and 0.05 levels (two-tailed), respectively

Table II.
Structural adjustment
paths and indices
related to tested
models

internal efficiency (Porter and Van der Linde, 1995), corporate reputation (Hart, 1995) and, not least, corporate competitiveness (Russo and Fouts, 1997).

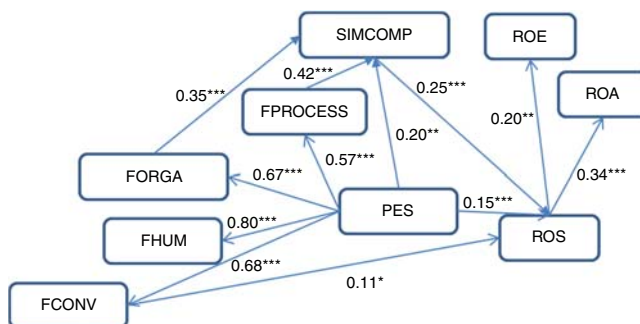
However, although our results show the direct impact of PES on ROS, we observed no direct effect on ROA or ROE. This finding indicates that PES improve margins, which are linked to both lower costs and differentiation effects (Ambec and Lanoie, 2008). The lack of a direct link between PES and ROA could be explained by the heavier assets and structural investments that these strategies require (Hart, 1995; Singh *et al.*, 2016). The increase in assets is therefore likely to deteriorate the “Sales/Assets” ratio. This ratio in combination with the ROS ratio would thereby have a reverse effect and the margin effect would decline because of the drop in volume (“Sales/Assets” ratio). This is a potential explanation for the differentiated influence of PES on ROS as opposed to ROA and ROE.

4.2 Individual mediating effects of the natural competences (H2, H3, H4)

PES have a particularly strong and significant effect on the development of the four natural competences, with coefficients ranging from 0.57 to 0.80 (see Table II), validating H2. These results are in line with Sharma and Vredenburg’s (1998) findings on the relationship between PES and organizational capabilities (Gelhard and Von Delft, 2016; Helfat *et al.*, 2007; Judge and Elenkov, 2005; Li and Liu, 2014), for the first time expanding this link to natural competences. In our case, the choice of PES fosters the development of a portfolio of natural competences (conventional, human, organization and procedural) in a top-down process, with top managers’ intent being central for implementing the strategy (Menguc *et al.*, 2010; Verbeke *et al.*, 2006).

However, H3 is only partially validated as conventional competence is the only natural competence that positively and significantly impacts ROS (see Table II), and this influence appears limited (0.11). Again, ROS is the only economic performance indicator that is directly impacted by conventional competence (ROA and ROE are affected indirectly). In this context, and in opposition to the “low-hanging fruit” theory, implementing a policy that goes beyond the mere correction of first-level malfunctions (Hart and Ahuja, 1996) generates higher gains than expenditures incurred, thereby demonstrating the contribution of conventional competence to corporate economic performance. More particularly, these results highlight the importance of green production processes and products – conventional competence – for margin growth and corporate differentiation.

We were nevertheless unable to identify a direct link between the other environmental competences (organizational, human, procedural) and profitability. The mediating role of the natural competences in the relationship between PES and economic performance thus cannot



Notes: *, **, ***Significant at the 0.001, 0.01, and 0.05 levels (two-tailed), respectively

Figure 1. Graphical representation of Model 3

be fully confirmed, with conventional competence (FCONV) being the only mediator (identification of a causal path). However, this mediating role was reinforced by the joint analysis of Models 1 and 2. Introducing the link between FCONV and ROS (Model 2) reduced the influence of PES on ROS (whose coefficient changed from 0.28 in Model 1 to 0.20 in Model 2). The comparison of the two models highlights the proportion of variance of profitability explained by conventional competence in Model 2, which was wrongly integrated in Model 1 into the relationship between PES and economic performance. *H4* is thus only partially validated by our results. Three points can be raised to interpret this situation.

First and as we explained, conventional competence is likely to have a direct effect on corporate margins – through products and packaging – because of its contribution to cost control and differentiation in terms of both using and signaling criteria. The other natural competences – organizational, human and procedural – might have a more indirect or diffuse effect on processes or organizational effectiveness. They can perhaps be seen as competences that support strategy implementation, and their impact on margins would occur through the influence of conventional competences.

Second, the nature of the competences might explain this finding. Indeed, the lack of impact on economic performance could be explained by the limits of natural competences in terms of path dependency, complexity and inimitability, unlike the organizational capabilities (Gelhard and Von Delft, 2016; Helfat *et al.*, 2007; Judge and Elenkov, 2005; Li and Liu, 2014) operationalized by Sharma and Vredenburg (1998). For example, a high level of natural competences says nothing about their pioneering nature. According to Claver *et al.* (2007), however, pioneering strategies are exactly what makes these competences hard to imitate and help build competitive advantage (Hull and Rothenberg, 2008).

The third and last explanation is related to *H6*. As stated by Hart (1995), the simultaneous development of natural competences is the key factor of competitive advantage and economic performance, not each natural competence taken in isolation.

4.3 Simultaneous mediating effects of natural competences (*H5*, *H6*, *H7*)

Model 3 validates *H5*, showing the significant positive impact of PES on the simultaneous development of natural competences (SIMCOMP), and *H6*, showing a significant positive influence of SIMCOMP on profitability via its direct impact on ROS. The mediating role of SIMCOMP in the relationship between PES and profitability is also confirmed, validating *H7*. Again, comparison of Models 2 and 3 reinforces this conclusion because the introduction of the mediating effect of SIMCOMP reduced the strength of the relationship between PES and ROS (with coefficient changes from 0.2 to 0.15). The comparison of the two models highlights the proportion of variance of profitability explained by SIMCOMP in the relationship between PES and economic performance in Model 3 that was wrongly integrated into Model 2. Our results thus demonstrate for the first time a causal path from PES, through the simultaneous development of four natural competences, to economic performance. The strategic intent of top managers to proactively engage in the natural environment is therefore the factor that boosts investment in a portfolio of natural competences, which in return positively impacts margins and competitive advantage. Beyond the development of natural competences *per se*, the simultaneous investment in a portfolio of competences – and its complexity and path dependency – increases a company's ability to coordinate, reconfigure and transform its assets, thereby boosting competitiveness (Sharma and Vredenburg, 1998; Verbeke *et al.*, 2006). This result confirms the "embeddedness" of these competences, as they operate weakly on an individual basis but generate outperformance together.

Our results also reveal a positive and significant relationship between some of the natural competences, the SIMCOMP, and economic performance (see Figure 1). A second causal chain thus appears in parallel to the first chain linking PES, SIMCOMP and profitability. Indeed, PES positively impact organizational and procedural competences, which in return have a positive

effect on SIMCOMP, which then positively affects economic performance indirectly. Organizational and procedural competences do not directly influence profitability but they contribute to balanced growth in investment in all the natural competences. This supports our interpretation of the partial validation of *H3* and *H4*. These two competences support and facilitate strategy implementation by stimulating investments in all the natural competences and improving conventional competence, which contributes to a cost or differentiation strategy.

4.4 The role of size and innovation

Model 4 shows that introducing innovation and firm size does not change the nature or strength of the hypotheses when financial risk and growth have no significant influence.

In our analysis of the significant relationships, we first show that size positively influences the development of procedural and organizational competences. Therefore, we must also emphasize the indirect influence of size on the simultaneous development of natural competences through its action on procedural and organizational competences. Large companies are indeed more likely to establish hierarchical structures and formalized procedures to manage environmental issues (availability of resources and ability to formalize) and support strategic implementation (Claver *et al.*, 2007).

Furthermore, size positively influences the development of PES. Small and medium-sized enterprises lack the resources to resist stakeholder pressures and have a faster and easier decision process and strong innovation capabilities (Albort-Morant *et al.*, 2016; Ramanathan *et al.*, 2010) that allow them or push them to transform the natural environment into opportunities (Darnall *et al.*, 2010), but large companies are nevertheless facing stronger institutional pressures in this area (legal and normative requirements). Moreover, the visibility of their activities often reinforces the pressure of pro-environment external stakeholders (Hart, 1995; Henriques and Sadorsky, 1999) who push top managers to proactively engage in environmental strategies (Bowen and Sharma, 2005; Buysse and Verbeke, 2003; Zou *et al.*, 2015).

Last, innovation positively influences economic performance through a significant direct impact on ROS, with no effect on other relationships. Thus, we can assume that the effects of PES and the simultaneous development of natural competences on economic performance are independent of the influence of innovation on profitability, in accordance with the results of Hull and Rothenberg (2008), who showed that innovation and a social responsibility perspective are both drivers of differentiation (different alternatives) (Arendt and Brettel, 2010; Ramanathan *et al.*, 2010).

5. Conclusion

Is it important for top managers to engage time and money in taking a proactive stance on the natural environment? How can they best manage this engagement to obtain an appropriate return on investment? Ultimately, is it worth it? To address these questions, we investigated the relationship between PES and economic performance by taking into account the mediatory role of natural competences from a resource-based view. This study was designed to resolve two main limitations of earlier studies: the lack of attention to mediatory linkages and the operationalization of natural competences with clarification and transparency regarding our methodological choices.

First, our results show that PES have a positive impact on profitability through their actions on margins, and we demonstrate two causal chains that confirm the relevance of our framework. We provide evidence of the mediating role of conventional competence in the PES-economic performance relationship (PES positively influence all four competences but only conventional competence has an impact on profitability) and then show the mediating role of the simultaneous development of the four natural competences. This result highlights the entrenched nature of these competences, which, when developed jointly and simultaneously, lead to a competitive advantage.

Thus, although conventional competence contributes to economic performance, managers must focus on balanced growth in all the natural competences to ensure optimal profitability. Our results also indicate that organizational and procedural competences help to promote the simultaneous development of natural competences and indirectly influence profitability (facilitating role). Last, we note that the size of the company encourages the development of PES and that the action of PES (whether direct or indirect) is independent of the influence of innovation.

In general, our findings support a “win-win” view of “being green” and “being profitable,” showing that it does pay to be green (Chen *et al.*, 2016; Clarkson *et al.*, 2011; Epstein and Roy, 1998; Lo *et al.*, 2012). We thus contribute to showing how strong corporate engagement in environmental protection is likely to provide competitive advantages to companies (Porter and Van der Linde, 1995).

5.1 Theoretical contributions

Our study provides further support for the resource-based view, especially regarding the “environmental” aspect of this theoretical framework, and enriches our understanding of how sustainability policies are integrated within companies. Our research highlights the conditions needed to create the business case for sustainability by focusing on the corporate strategic intent captured through PES, the natural competences needed to bring them to life and the impact of these initiatives on performance (Lloret, 2016).

First, with regard to PES – defined as top management’s strategic intent or orientation – we confirm the importance of an internal perspective on corporate strategies for the natural environment. Although many studies emphasize the importance of a strong stakeholder orientation (Hauser, 2016; Lee, 2011), which is by the external nature (Delgado-Ceballos *et al.*, 2012), our study shows that a deep focus on the inner workings of the company, and how it translates a strategic orientation into management practices as a source for economic performance, is of tremendous importance (Malik, 2015; Wong *et al.*, 2012). We especially confirm the persistent need for a top-down strategic approach to the natural environment (Zou *et al.*, 2015), without which any commitment to the natural environment would be pointless (Menguc *et al.*, 2010; Verbeke *et al.*, 2006). Our results show first that PES have a positive impact on profitability, through their actions on margins. This finding supports the idea that PES act as levers of differentiation and lower costs, independently of their actions in terms of internal and external legitimacy, which may enhance differentiation and internal efficiency (Singh *et al.*, 2016).

We also advance knowledge on the definition of natural competences, especially regarding hierarchy and complementarity (Gelhard and Von Delft, 2016). Our study of the mediatory role of these competences indicates how they might be combined or prioritized to address environmental issues and develop a profitable commitment in this field. We especially demonstrate the key role of conventional competence in building differentiation strategies in industries where products are particularly scrutinized by consumers (Journeault, 2016; Singh *et al.*, 2012) and indicate how other competences might appear as “shadow skills.” In this sense, they foster the inclusion of a strategic commitment to the natural environment through a translation process before this commitment can be transformed into a competitive advantage advocated by customers (Huang, 2016).

5.2 Empirical contributions

Our study provides a significant empirical contribution: for the first time to our knowledge, two causal chains between PES and profitability are highlighted with the mediating roles of both conventional competence alone and the simultaneous development of natural competences. In addition to these mediating effects, our paper also highlights the facilitating role of organizational and procedural competences.

Moreover, we have given special attention to the operationalization of our variables: they were carefully defined, taking into account their entrenchment; reliable and robust measurement scales were then built; and common method bias, a widespread problem in this field, was limited to the best of our ability (Molina-Azorin *et al.*, 2009). Our study is especially notable for its operationalization of the natural competences. Indeed, despite the profuse literature on this subject, few empirical studies have dealt with organizational, procedural and human competences for the natural environment to test their relationships with other constructs (Buysse and Verbeke, 2003; Henriques and Sadorsky, 1999; Paillé and Raineri, 2015; Sharma and Vredenburg, 1998).

Although various studies have mentioned the concept of natural competences, few have contributed to defining and operationalizing them for a given industry. The precautions we took in designing this study enabled us to develop relevant measures and to respect the principle of the embeddedness of these competences (Barney, 1991; Bowen and Sharma, 2005).

5.3 Practical contributions

This paper also makes significant managerial contributions. First, it provides top managers with a demonstration of the benefits of PES. Indeed, an anticipatory approach to the constraints regarding the natural environment – namely institutional and stakeholder pressures (Lee, 2011) – seems to be a condition for seizing opportunities and building the business case for sustainability. More especially, it shows the importance of ensuring that managers at the highest levels are on board, which can be done, for example, by proposing attractive compensation packages (Zou *et al.*, 2015). It also recalls the need to ensure sufficient slack in financial and human resources to support the PES (Singh *et al.*, 2016).

In addition, our study gives top managers information on the key role of natural competences and how they can be developed to build the business case for PES. The main recommendation is to foster the development of a portfolio of these competences and to do so by ensuring that they are entrenched in their specific environment. In this regard, the study brings key insights for managers to integrate environmental concerns within organizations (Wagner, 2015). For example, it underlines the importance of employee skills and the participation in relevant networks to enhance “green learning” (Albort-Morant *et al.*, 2016; Paillé and Raineri, 2015). The results also indicate that PES need to be translated into dedicated structures and processes related to environmental concerns (Wong *et al.*, 2012). Last, they highlight the “market” orientation necessary to transform an internal engagement into a strong and visible competitive advantage, like brand strategies that allow for perceived differentiation (Singh *et al.*, 2012).

Some limitations of this study should be noted, although they encourage further research in this field. First, the choice of exploratory perceptual variables for PES and the natural competences (non-financial variables) – which are useful to avoid common method bias – requires further validation through new studies. Second, the measure of economic performance (Ahmed *et al.*, 1998) in other samples might include stock market measures or be supplemented by non-financial variables, such as the balanced scorecard (Kaplan and Norton, 1992). Moreover, the choice we made to consider, with instant cutting, the level of development of the natural competences and the degree of PES may also be a limitation due to differing temporal effects between these two variables. In this regard, a longitudinal approach would be an interesting avenue for future research. Then, expanding this study to other industries or regions would undoubtedly yield useful data to improve the external validity of our research based on the limited sector of FB and HP in France. Last, more qualitative and longitudinal studies would enrich our understanding of the key role played by natural competences over time and the key features of their development and entrenchment in coherence with a search for profitability.

Notes

1. Details on the meaning these authors give to natural competences are given in Table I.
2. The French institutional context of this industry is characterized by strong regulation of corporate practices, notably by mimetic and normative pressures but also through coercive pressure, as is the case in any state-led market economy (Kang and Moon, 2012). However, these pressures have little impact on whether French companies simply respond to them (reactive strategy) or anticipate them (proactive strategy) (Lee, 2011). This is particularly the case in the “environmental” area where legal pressures are dominated by “soft-law” constraints, thus leaving discretion to companies (Delbard, 2008).
3. The Diane database is produced by the Van Dijk Office and it provides instant access to financial information and capital links of French companies for economic analysis. Diane is a powerful research and analysis tool that provides comprehensive, up-to-date information on companies and is unique in the market. For more information, see: www.bvdinfo.com/fr-fr/our-products/company-information/national-products/diane
4. A qualitative study was conducted using interviews (16 in total) with managers from a large multinational company in the beverage industry and non-participant observation of a group called “Demeter” composed of French public and private stakeholders working on sustainable development issues.
5. This step led us to initially retain six items for conventional competence, seven items for human competence, seven items for organizational competence, six items for procedural competence, and five items for strategic planning competence.
6. ROA was calculated using the following ratio: (net income + tax + interest + company financial expenses)/(net operating assets).
7. ROS was calculated using the following ratio: operating result/turnover.
8. ROE was calculated using the following ratio: net income/equity.
9. RISK was calculated using the average ratio: long-term debt/total assets for the years 2009-2011.
10. SALES were calculated using the average turnover for the years 2009-2011.
11. R&D was calculated using the average ratio: intangible fixed assets/total assets for the years 2009-2011.

References

- Ahmed, N.U., Montagnò, R.V. and Firenze, R.J. (1998), “Organizational performance and environmental consciousness: an empirical study”, *Management Decision*, Vol. 36 No. 2, pp. 57-62.
- Albort-Morant, G., Leal-Millán, A. and Cepeda-Carrión, G. (2016), “The antecedents of green innovation performance: a model of learning and capabilities”, *Journal of Business Research*, Vol. 69 No. 11, pp. 4912-4917.
- Ambec, S. and Lanoie, P. (2008), “Does it pay to be green? A systematic overview”, *Academy of Management Perspectives*, Vol. 22 No. 4, pp. 45-62.
- Aragón-Correa, J.A. and Rubio-Lopez, E.A. (2007), “Proactive corporate environmental strategies: myths and misunderstandings”, *Long Range Planning*, Vol. 40 No. 3, pp. 357-381.
- Aragón-Correa, J.A. and Sharma, S. (2003), “A contingent resource-based view of proactive corporate environmental strategy”, *Academy of Management Review*, Vol. 28 No. 1, pp. 71-88.
- Aragón-Correa, J.A., Marcus, A. and Hurtado-Torres, N. (2016), “The natural environmental strategies of international firms: old controversies and new evidence on performance and disclosure”, *The Academy of Management Perspectives*, Vol. 30 No. 1, pp. 24-39.
- Arend, R.J. (2014), “Social and environmental performance at SMEs: considering motivations, capabilities, and instrumentalism”, *Journal of Business Ethics*, Vol. 125 No. 4, pp. 541-561.

- Arendt, S. and Brettel, M. (2010), "Understanding the influence of corporate social responsibility on corporate identity, image, and firm performance", *Management Decision*, Vol. 48 No. 10, pp. 1469-1492.
- Armstrong, J.S. and Overton, T.S. (1977), "Estimating non-response bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.
- Arrègle, J.L. (1996), "Analyse resource based et identification des actifs stratégiques", *Revue française de gestion*, Vols 3-5 No. 128, pp. 25-36.
- Bansal, P. (2005), "Evolving sustainability: a longitudinal study of corporate sustainable development", *Strategic Management Journal*, Vol. 26 No. 3, pp. 197-218.
- Bansal, P. and Song, H-C. (2017), "Similar but not the same: differentiating corporate responsibility from sustainability", *Academy of Management Annals*, Vol. 11 No. 1, pp. 105-149.
- Barney, J.B. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.
- Bowen, F.E. and Sharma, S. (2005), "Resourcing corporate environmental strategy: behavioural and resource-based perspectives", paper presented at Academy of Management, Honolulu, HI, August 5-10, available at: <http://proceedings.aom.org/content/2005/1/A1.20.short> (accessed October 18, 2017).
- Buysse, K. and Verbeke, A. (2003), "Proactive environmental strategies: a stakeholder management perspective", *Strategic Management Journal*, Vol. 24 No. 5, pp. 453-470.
- Byrne, B.M. (2010), *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*, 2nd ed., Taylor & Francis Group, New York, NY.
- Calantone, R.J., Schmidt, J.B. and Song, X.M. (1996), "Controllable factors of new product success: a cross-national comparison", *Marketing Science*, Vol. 15 No. 4, pp. 341-358.
- Chen, P.H., Ong, C.F. and Hsu, S.C. (2016), "Understanding the relationships between environmental management practices and financial performances of multinational construction firms", *Journal of Cleaner Production*, Vol. 139 No. 15, pp. 750-760.
- Choi, J. and Wang, H. (2009), "Stakeholder relations and the persistence of corporate financial performance", *Strategic Management Journal*, Vol. 30 No. 8, pp. 895-907.
- Christmann, P. (2000), "Effects of 'best practices' of environmental management on cost advantage: the role of complementary assets", *Academy of Management Journal*, Vol. 43 No. 4, pp. 663-680.
- Clarkson, M.B.E. (1995), "A stakeholder framework for analyzing and evaluating corporate social performance", *Academy of Management Review*, Vol. 20 No. 12, pp. 92-117.
- Clarkson, P., Richardson, G. and Vasivari, F. (2011), "Does it really pay to be green? Determinants and consequences of proactive environmental strategies", *Journal of Accounting and Public Policy*, Vol. 30 No. 2, pp. 122-144.
- Claver, E., Lopez, M.D., Molina, J.F. and Tari, J.J. (2007), "Environmental management and firm performance: a case study", *Journal of Environmental Management*, Vol. 84 No. 4, pp. 606-619.
- Collis, D.J. and Montgomery, C.A. (1995), "Competing on resources: strategy in the 1990s", *Harvard Business Review*, Vol. 73 No. 4, pp. 118-128.
- Darnall, N. and Edwards, J.R. (2006), "Predicting the cost of environmental management system adoption: the role of capabilities, resources and ownership structure", *Strategic Management Journal*, Vol. 27 No. 2, pp. 301-330.
- Darnall, N., Henriques, I. and Sadorsky, P. (2010), "Adopting proactive environmental strategy: the influence of stakeholders and firm size", *Journal of Management Studies*, Vol. 47 No. 6, pp. 1072-1094.
- Delbard, O. (2008), "CSR legislation in France and the European regulatory paradox: an analysis of EU CSR policy and sustainability reporting practice", *Corporate Governance*, Vol. 8 No. 4, pp. 397-405.
- Delgado-Ceballos, J., Aragón-Correa, J.A., Ortiz-de-Mandojana, N. and Rueda-Manzanares, A. (2012), "The effect of internal barriers on the connection between stakeholder integration and proactive environmental strategies", *Journal of Business Ethics*, Vol. 107 No. 3, pp. 281-293.

- Devinney, T.M. (2009), "Is the socially responsible corporation a myth? The good, the bad, and the ugly of corporate social responsibility", *The Academy of Management Perspectives*, Vol. 23 No. 2, pp. 44-56.
- Dixon-Fowler, H.R., Slater, D.J., Johnson, J.L., Ellstrand, A.E. and 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*, Vol. 112 No. 2, pp. 353-366.
- Epstein, M. and Roy, M.J. (1998), "Managing corporate environmental performance: a multinational perspective", *European Management Journal*, Vol. 16 No. 3, pp. 284-296.
- Flammer, C. and Kacperczyk, A. (2015), "The impact of stakeholder orientation on innovation: evidence from a natural experiment", *Management Science*, Vol. 62 No. 7, pp. 1982-2001.
- Fornell, C. and Larcker, D.F. (1981), "Evaluation structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.
- Garzella, S. and Fiorentino, R. (2014), "An integrated framework to support the process of green management adoption", *Business Process Management Journal*, Vol. 20 No. 1, pp. 68-89.
- Gelhard, C. and Von Delft, S. (2016), "The role of organizational capabilities in achieving superior sustainability performance", *Journal of Business Research*, Vol. 69 No. 10, pp. 4632-4642.
- Gherzi, G. and Rastoin, J.L. (2010), *Le système alimentaire mondial: Concepts et méthodes, analyses et dynamiques*, Editions Quae, Paris.
- Godfrey, P.C., Merrill, C.B. and Hansen, J.M. (2009), "The relationship between corporate social responsibility and shareholder value: an empirical test of risk management hypothesis", *Strategic Management Journal*, Vol. 30 No. 4, pp. 425-445.
- Gonzalez-Benito, J. and Gonzalez-Benito, O. (2005), "Environmental proactivity and business performance: an empirical analysis", *Omega*, Vol. 33 No. 1, pp. 1-15.
- Grant, R.M. (1991), "The resource-based theory of competitive advantage: implications for strategy formulation", *California Management Review*, Vol. 33 No. 3, pp. 114-135.
- Hamel, G. and Prahalad, C.K. (1994), "Strategy as a field of study: why search for a new paradigm?", *Strategic Management Journal*, Vol. 15 No. 2, pp. 5-16.
- Hart, S. and Ahuja, G. (1996), "Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance", *Business Strategy and the Environment*, Vol. 5 No. 1, pp. 30-37.
- Hart, S.L. (1995), "A natural-resource-based view of the firm", *Academy of Management Review*, Vol. 20 No. 4, pp. 986-1014.
- Hauser, S. (2016), "Stakeholder influence and the diffusion of eco-efficiency practices in the natural gas exploration and production industry", *International Journal of Energy Sector Management*, Vol. 10 No. 1, pp. 56-68.
- Helfat, C., Finkelstein, S., Mitchell, W., Peteraf, M., Sing, H., Teece, D.J. and Winter, S.G. (2007), *Dynamic Capabilities: Understanding Strategic Change in Organizations*, Blackwell, Malden, MA.
- Henriques, I. and Sadorsky, P. (1999), "The relationship between environmental commitment and managerial importance of stakeholder importance", *Academy of Management Journal*, Vol. 42 No. 1, pp. 87-99.
- Hinkin, T.R. (1995), "A review of scale development practices in the study of organizations", *Journal of Management*, Vol. 21 No. 5, pp. 957-988.
- Horvathova, E. (2010), "Does environmental performance affect financial performance? A meta-analysis", *Ecological Economics*, Vol. 70 No. 1, pp. 52-59.
- Huang, H. (2016), "Media use, environmental beliefs, self-efficacy, and pro-environmental behavior", *Journal of Business Research*, Vol. 69 No. 6, pp. 2206-2212.
- Hull, C.E. and Rothenberg, S. (2008), "Firm performance: the interactions of corporate social performance with innovation and industry differentiation", *Strategic Management Journal*, Vol. 29 No. 7, pp. 781-789.

- Journeault, M. (2016), "The influence of the eco-control package on environmental and economic performance: a natural resource-based approach", *Journal of Management Accounting Research*, Vol. 28 No. 2, pp. 149-178.
- Judge, W.Q. and Elenkov, D. (2005), "Organizational capacity for change and environmental performance: an empirical assessment of Bulgarian firms", *Journal of Business Research*, Vol. 58 No. 7, pp. 893-901.
- Kang, N. and Moon, J. (2012), "Institutional complementarity between corporate governance and corporate social responsibility: a comparative institutional analysis of three capitalisms", *Socio-Economic Review*, Vol. 10 No. 1, pp. 85-108.
- Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard – measures that drive performance", *Harvard Business Review*, Vol. 1 Nos 7-8, pp. 71-79.
- Lambert, D.M. and Harrington, T.C. (1990), "Measuring nonresponse bias in customer service mail surveys", *Journal of Business Logistics*, Vol. 11 No. 2, pp. 5-25.
- Lee, K.H., Cin, B.C. and Lee, E.Y. (2016), "Environmental responsibility and firm performance: the application of an environmental, social and governance model", *Business Strategy and the Environment*, Vol. 25 No. 1, pp. 40-53.
- Lee, M.-D.P. (2011), "Configuration of external influences: the combined effects of institutions and stakeholders on corporate social responsibility strategies", *Journal of Business Ethics*, Vol. 102 No. 2, pp. 281-298.
- Li, D.Y. and Liu, J. (2014), "Dynamic capabilities, environmental dynamism, and competitive advantage: evidence from China", *Journal of Business Research*, Vol. 67 No. 1, pp. 2793-2799.
- Lloret, A. (2016), "Modeling corporate sustainability strategy", *Journal of Business Research*, Vol. 69 No. 2, pp. 418-425.
- Lo, C.K.Y., Yeung, A.C.L. and Cheng, T.C.E. (2012), "The impact of environmental management systems on financial performance in fashion and textiles industries", *International Journal of Production Economics*, Vol. 135 No. 2, pp. 561-567.
- McWilliams, A. and Siegel, D. (2000), "Corporate social responsibility and financial performance: correlation or misspecification?", *Strategic Management Journal*, Vol. 21 No. 5, pp. 603-610.
- Malik, M. (2015), "Value-enhancing capabilities of CSR: a brief review of contemporary literature", *Journal of Business Ethics*, Vol. 127 No. 2, pp. 419-438.
- Menguc, B., Auh, S. and Ozanne, L. (2010), "The interactive effect of internal and external factors on a proactive environmental strategy and its influence on a firm's performance", *Journal of Business Ethics*, Vol. 94 No. 2, pp. 279-298.
- Molina-Azorin, J.F., Claver-Cortés, E., Lopez-Gamero, M.D. and Tan, J.J. (2009), "Green management and financial performance: a literature review", *Management Decision*, Vol. 47 No. 7, pp. 1080-1100.
- Orlitzky, M., Schmidt, F.L. and Rynes, S.L. (2003), "Corporate social and financial performance: a meta-analysis", *Organization Studies*, Vol. 24 No. 3, pp. 403-441.
- Paillé, P. and Raineri, N. (2015), "Linking perceived corporate environmental policies and employees eco-initiatives: the influence of perceived organizational support and psychological contract breach", *Journal of Business Research*, Vol. 68 No. 11, pp. 2404-2411.
- Peteraf, M.A. (1993), "The cornerstones of competitive advantage: a resource-based view", *Strategic Management Journal*, Vol. 14 No. 3, pp. 179-191.
- Porter, M.E. and Van der Linde, C. (1995), "Toward a new conception of the environment-competitiveness relationship", *Journal of Economic Perspectives*, Vol. 9 No. 4, pp. 97-118.
- Qiu, Y., Shaikat, A. and Tharyan, R. (2016), "Environmental and social disclosures: link with corporate financial performance", *The British Accounting Review*, Vol. 48 No. 1, pp. 102-116.
- Ramanathan, R., Black, A., Nath, P. and Muyldermans, L. (2010), "Impact of environmental regulations on innovation and performance in the UK industrial sector", *Management Decision*, Vol. 48 No. 10, pp. 1493-1513.

- Rondinelli, D.A. and Vastag, G. (2000), "Panacea, common sense, or just label? The value of ISO 14001 environmental management systems", *European Management Journal*, Vol. 18 No. 5, pp. 499-510.
- Russo, M.V. and Fouts, P.A. (1997), "A resource-based perspective on corporate environmental performance and profitability", *Academy of Management Journal*, Vol. 40 No. 3, pp. 534-559.
- Sharma, S. and Vredenburg, H. (1998), "Proactive corporate environmental strategy and the development of competitively organizational capabilities", *Strategic Management Journal*, Vol. 19 No. 8, pp. 728-753.
- Shrivastava, P. and Hart, S.L. (1994), "Greening organizations 2000", *International Journal of Public Administration*, Vol. 17 Nos 3-4, pp. 607-635.
- Singh, J.J., Iglesias, O. and Batista-Foguet, J.M. (2012), "Does having an ethical brand matter? The influence of consumer perceived ethicality on trust, affect and loyalty", *Journal of Business Ethics*, Vol. 111 No. 4, pp. 541-549.
- Singh, N., Ma, J. and Yang, J. (2016), "Optimizing environmental expenditures for maximizing economic performance", *Management Decision*, Vol. 54 No. 10, pp. 2544-2561.
- Starik, M. and Rands, G.P. (1995), "Weaving an integrated web: multilevel and multisystem perspectives of ecologically sustainable organizations", *Academy of Management Review*, Vol. 20 No. 4, pp. 908-935.
- Teece, D., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.
- Torugsa, N.A., O'Donohue, W. and Hecker, R. (2012), "Capabilities, proactive CSR and financial performance in SMEs: empirical evidence from an Australian manufacturing industry sector", *Journal of Business Ethics*, Vol. 109 No. 4, pp. 483-500.
- Verbeke, A., Bowen, F.E. and Sellers, M. (2006), "Corporate environmental strategy: extending the natural resource-based view of the firm", paper presented at Academy of Management, Atlanta, GA, August 11-16, available at: <http://proceedings.aom.org/content/2006/1/A1.18.abstract?sid=4529fa69-3594-4752-bf65-694f7d3504da> (accessed October 18, 2017).
- Wagner, M. (2015), "The link of environmental and economic performance: drivers and limitations of sustainability integration", *Journal of Business Research*, Vol. 68 No. 6, pp. 1306-1317.
- Welford, R. (1993), "Breaking the link between quality and the environment: auditing for sustainability and life cycle analysis", *Business Strategy and the Environment*, Vol. 2 No. 4, pp. 25-33.
- Wong, C.W., Lai, K.H., Shang, K.C., Lu, C.S. and Leung, T.K.P. (2012), "Green operations and the moderating role of environmental management capability of suppliers on manufacturing firm performance", *International Journal of Production Economics*, Vol. 140 No. 1, pp. 283-294.
- Zou, H.L., Zeng, S.X., Lin, H. and Xie, X.M. (2015), "Top executives' compensation, industrial competition, and corporate environmental performance: evidence from China", *Management Decision*, Vol. 53 No. 9, pp. 2036-2059.

Items ^a	Cronbach's α	Convergent validity ρ	Joreskog's ρ
Wide consultation precedes each decision of top management on environmental sustainability issues*	0.882	0.595	0.879
Our top management is independent from stockholders in making decisions related to environmental sustainability			
Our company ought to be an example of good citizenship*			
Our company invests a lot in local development (philanthropy, sponsoring, etc.)*			
Preserving the natural environment is one of our corporate missions			
Environmental sustainability is a great business opportunity to develop our company			
Our company always goes beyond what the environmental sustainability regulations recommend			
Our company is engaged in environmental sustainability issues because our top management wants to be a driving force for sustainability			

Note: ^aItems marked with an asterisk were removed after factor analysis

Items ^a	Cronbach's α	Average variance extracted (AVE)	Joreskog's ρ
<i>Conventional competence</i>			
Our company is strongly committed to processes of reducing its environmental impact*	0.888	0.687	0.897
We are constantly looking for new technologies that consume fewer resources			
Our company innovates and rethinks its manufacturing process based on sustainable development	0.850	0.63	0.835
Our company is part of a preventive approach at source			
Our research and development policy is deeply oriented toward sustainable development			
<i>Organizational competence</i>			
The functions dealing with sustainable development are directly related to our top management	0.850	0.63	0.835
The person in charge of sustainable development sits on the Executive Board (or Board) of the company*			
For us, the person in charge of sustainable development coordinates all other functions of the company on this issue			
In our company, all decisions related to sustainable development are centralized to the head of sustainability			
<i>Human competence</i>			
Our entire staff is highly qualified in the field of sustainable development	0.815	0.600	0.818
Environmental criteria are used to assess the performance of our managers			
Sustainability is part of our corporate culture			
<i>Procedural competence</i>			
We have standard procedures for environmental management	0.935	0.773	0.931
All environmental management procedures are written			
Our company is certified in the field of environmental management (ISO 14001, EMAS, etc.)			
Our company frequently conducts environmental audits			

Table AII.
Construction, validity and reliability of natural competences measurement

Notes: ^aThe items in this table come from the results of the EFA. Items with an asterisk were eliminated from the CFA. Cronbach's α , convergent validity of the ρ and Joreskog's ρ are calculated on the solution initiated by the CFA

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