

INSEAD

The Business School  
for the World®

# Faculty & Research Working Paper

Customer Centricity and Adoption of  
Environmental Management Practices

---

Sanja PEKOVIC  
Sylvie ROLLAND  
Hubert GATIGNON  
2013/31/MKT

# Customer Centricity and Adoption of Environmental Management Practices

Sanja Pekovic\*

Sylvie Rolland\*\*

Hubert Gatignon\*\*\*

The authors gratefully acknowledge the financial support for this work from the AFNOR “*Performance des Organisations*” endowment in collaboration with the Paris-Dauphine Foundation.

\* Researcher at University of Paris-Dauphine (DRM- CNRS - UMR 7088), Place du Maréchal de Lattre de Tassigny 75775 PARIS Cedex 16, France. Email : [sanja.pekovic@dauphine.fr](mailto:sanja.pekovic@dauphine.fr)

\*\* Associate Professor at University Paris-Dauphine DRM-DMPS (CNRS UMR 7088) Place du Maréchal de Lattre de Tassigny 75775 PARIS Cedex 16, France.  
Email : [sylvie.rolland@dauphine.fr](mailto:sylvie.rolland@dauphine.fr)

\*\*\* Claude Janssen Chaired Professor of Business Administration and Professor of Marketing at INSEAD, Boulevard de Constance, 77305 Fontainebleau Cedex, France.  
Email : [hubert.gatignon@insead.edu](mailto:hubert.gatignon@insead.edu)

A Working Paper is the author’s intellectual property. It is intended as a means to promote research to interested readers. Its content should not be copied or hosted on any server without written permission from [publications.fb@insead.edu](mailto:publications.fb@insead.edu)

Find more INSEAD papers at [http://www.insead.edu/facultyresearch/research/search\\_papers.cfm](http://www.insead.edu/facultyresearch/research/search_papers.cfm)

## **Customer Centricity and Adoption of Environmental Management Practices**

**Abstract:** Environmental management practices are recognized to be critical for establishing a competitive edge. Such innovations are driven by the strategic orientation of the firm, in particular the extent to which the firm focuses on customers. However, the impact of customer centricity in firms' decision to adopt these practices has received little empirical attention. This study investigates the effect of three customer centricity components, namely customer information processing, responsiveness and values and norms, on a firm's decision to adopt environmental practices. Consistent with the strategy and marketing literature, we also examine the moderating effect of marketplace characteristics. Based on a large-scale survey of firms across industries, the results indicate that customer information processing and values and norms contribute directly to the adoption of environmental management practices. The results also show that the effects of customer information processing on environmental management practices are contingent on the levels of market competition.

**Keywords:** customer centricity, environmental management practices, industrial context.

## **1 Introduction**

Environmental concerns by consumers and firms have grown over the last thirty years but the recent economic crisis coupled with global sustainability issues has revived businesses' interest in environmental issues. In particular, these changes in the business environment bring pressure on firms to improve firm customer relations, reinforcing the need to adopt customer-centric strategies (Grewal and Tansuhaj 2001). However, while environmental issues have become central in the production/manufacturing discipline and an important area of strategy research, the marketing literature has remained scant, apart from consumer behavior research attempting to understand the adoption of environmental innovations by consumers (Craig and McCann 1978; Bourgeois and Barnes 1979; Labay and Kinnear 1981; Leonard-Barton 1981; Verhallen and van Raaij 1981). As it has become a major global societal concern accompanied by changes in regulatory environment, we need to better identify the implications on not only consumers' behavior but also on firms' responses to environmental innovations. The role of customer orientation in the innovation creation process has received a significant amount of attention in the marketing and strategy literature. Since the pioneering works of Deshpandé and Webster (1989), Narver and Slater (1990) and Kohli and Jaworski (1990), the focus has turned recently to the customer with the notion of customer centricity (Fader 2012) where the customer plays a more active role, such as in a co-creation process (Swami 2006; Hoyer et al. 2010; Dotson and Allenby 2010; Ghose and Han 2011; Ransbotham et al. 2012; Troye and Supphellen 2012). This role may be particularly relevant in the domain of environmental innovations: if customers value more and more environmental attributes and if firms are able to sense these tendencies, firms should adopt and develop innovations that improve products and services on these environmental dimensions. Yet, not all firms adopt such pro-environmental behaviors. In this research, our objective is to demonstrate the role played by customer centricity in environmental management practices adoption. While recently introduced, this concept of customer centricity is nevertheless based on the rich literature on market orientation that has been shown to have several facets. Consequently, we identify several dimensions of customer centricity that we hypothesize to have different impact on the adoption of environmental management practices by firms. In particular, it is our thesis that some dimensions of customer centricity are moderated by the industrial context in which firms operate while others are so fundamental that they are operative regardless of the context.

We first develop our conceptual framework explaining the adoption by firms of environmental management practices. Then we present our empirical analysis followed by the results discussion. We conclude with a discussion for advancing the interplay of firms and consumers' behavior in the evolution of environmental concerns in our economies.

## **2 Conceptual framework and hypotheses**

Our conceptual framework is represented graphically in Figure 1. Our focal variable is the adoption of environment management practices and especially of innovative administrative procedures concerned with the environment. In this research, we investigate the role that marketing plays in that adoption decision by considering various dimensions of customer centricity that have been recognized by the Marketing literature as important strategic factors to explain the performance of firms. We also consider several contextual factors that have been identified by prior research as significant moderators of customer centricity.

\*\*\*

[Insert Figure 1 about here]

\*\*\*

### **2.1 Customer Centricity**

Customer centricity (or customer orientation) is a notion that is at the heart of the marketing concept; it places customers at the center stage of the organization (Drucker 1954; Sheth et al. 2000; Wensley 1995). Despanhé and Webster (1989) define this principle as being part of the organization culture: the values and norms in the organization that guide behaviors within the organization. Narver and Slater (1990) explicitly consider market orientation as a set of shared values and beliefs that puts the customer's interest first. This philosophy of the organization corresponds to the objective for the firm to understand the needs of customers as they stand today as well as the market trends (Day 1994). Consistent with the view that customer centricity is a separate dimension of market orientation (Deshpandé et al. 1993; Gatignon and Xuereb 1997; Noble et al. 2002), customer centricity sets the organizational values and norms that will drive the firm's strategic decisions.

Kohli and Jaworski (1990) define market orientation by its behavioral consequences. These behaviors reflect the extent to which the organization implements the philosophy. Three

aspects of behavior have been identified for measuring the construct of a market oriented organization: (1) the generation of market intelligence pertaining to current and future needs of customers, (2) the dissemination of this market intelligence across departments and (3) the firm's responsiveness to such information. The first set of behaviors is recognized by Kohli and Jaworski (1990) as specifically referring to the concept of customer centricity. Homburg and Pflesser (2000) build on the behavioral approach of Kohli and Jaworski (1990) and the cultural approach of Narver and Slater (1990) to propose an integrating framework of customer centricity. Actually, in Homburg and Pflesser's analysis (2000) the behavioral and the cultural approaches are linked. Therefore, based on previous studies (e.g., Homburg and Pflesser 2000; Narver et al. 2004), our conceptual framework recognizes this dual perspective.

More recent research makes another distinction: activities that are geared towards discovering, understanding and satisfying the future latent needs of customers are viewed as different from those that enable firms to satisfy current customers. Atuahene-Gima et al. (2005) show how it is this first dimension that is key in explaining new product performance of the firm. More specifically, customer centricity is positively related to idea generation, because customer-centric firms acquire more market information that is critical for recognizing new customer opportunities and initiating creative output (Langerak et al. 2007). In the second case, the objective of the information obtained is to end up with satisfied customers; the focus is then on the ability to be reactive to avoid dissatisfaction and to make corrections if necessary (Ketchen et al. 2007). Therefore, the distinction can be made between the generation of market intelligence that proactively intends to anticipate customer needs and market intelligence that allows a firm to respond quickly to customer claims. This responsiveness facet corresponds to von Hippel (1978)'s notion of manufacturer-active paradigm where the firm is reactive to unsatisfied customer needs, as opposed to the customer-active paradigm where customers play an active role in the innovation process. This is a particularly important area in service industries where satisfaction of consumers is vital for ensuring their loyalty and repeat purchases. The emphasis placed by service companies to react to unsatisfied customers and guarantee post-complaint satisfaction is a testimony of this particular type of responsive consumer-centricity (Gelbrich and Roschk 2011a; 2011b).

Therefore, in light of this literature, we identify three dimensions of customer centricity. The first one is a broad cultural notion that corresponds to values and norms of the firm. The second corresponds to information collection, analysis and dissemination in order to

proactively anticipate customer needs. The third dimension of responsiveness corresponds to the ability to react to customer claims. We discuss in the next section the reasons for why it is critical to evaluate separately the impact of each of these dimensions of customer centricity. They each play a different role in explaining the extent to which different firms adopt environmental management practices.

## 2.2 Adoption of Environmental Management Practices

The focus of our study is on the adoption of environmental management practices. The marketing literature has examined extensively the impact of customer centricity on the firm's innovativeness from a product or service creation point of view as well as in terms of the adoption of innovations. The adoption of administrative innovations has also been a core of the organizational behavior literature (e.g., Kimberly and Evanisko 1981). Administrative innovations are related to the management of the firm in terms of the work organization and processes (Utterback and Abernathy 1975; Damanpour and Evan 1984; Hurley and Hult 1998). However, the role of customer centricity in the adoption of such administrative innovations in general and environmental management practices in particular remains rare (with perhaps the exception of Han et al. 1998<sup>1</sup>). In fact, it is surprising that in a meta-analysis of the adoption of innovations by organizations, Damanpour (1991) does not report any variable related to customers. Yet, the adoption of environmental practices is often the result of the market, either through latent demand or because of the pressures exercised by the market. Therefore, the question we are asking concerns whether the adoption of environmental management practices is affected by the firm's views of customers.

Indeed, innovation adoption is more likely from firms that are market oriented. For example, Han et al. (1998) show that market orientation leads to a greater number of technical and administrative innovations being implemented. A number of other studies have also demonstrated the specific role of a firm's customer centricity on the degree of innovation it creates (e.g., Frambach et al. 2003). In particular, Gatignon and Xuereb (1997) show that customer centricity (as opposed to competitor or technology orientation) influences non only the number of new products but also leads to new products that are less radical and that tend to be more similar to existing products. We build on these results to analyze the special issue of environmental management practices.

---

<sup>1</sup> Even though Hurley and Hult (1998) include "market focus" in their conceptual framework as a cultural variable affecting firm innovativeness, this variable is not retained in their empirical analysis.

The environment is clearly an area of increased concern for organizations worldwide as it has become difficult for firms to ignore the pitfalls associated with non-environmentally friendly strategies. Firms are encouraged to take a more proactive stance regarding environmental issues. The goal tends to be to consider environmental aspects in an integrated fashion in areas such as product design, manufacturing process, marketing, product delivery and use, customer service and post-consumer product disposal (Hunt and Auster 1990). Through an integration of marketing, management, and operations, “green strategy” (Ginsberg and Bloom 2004) identifies the various stakeholders, individuals or groups that can affect a company's performance or are affected by a company's actions (Freeman 1984). We focus on customers because they may determine how critical the environment is in their consumption behaviors. Environmental management practices such as ISO 14000 standards, EMAS or Responsible Care programs are defined as practices that reduce the harmful effect of business activities on the natural environment (Grolleau et al., 2007). The adoption of these standards requires for their implementation that firms set up new intangible administrative processes and procedures that promote within the organization a commitment to improve the natural environment (Delmas 2002; Delmas and Pekovic 2012). These organizational changes correspond to new management systems, administrative processes, and staff development programs (Subramanian and Nilakanta 1996). Companies choosing such standards are innovative organizations committed to superior customer value throughout their entire business system and not solely attempting to improve individual products or services (Parsons 1991). Moreover, environmental management practices such as ISO 14000 standard are relevant to a broader set of stakeholders (not only customers) such as NGOs, regulators, and other noneconomic parties (Albuquerque et al. 2007).

Customers can drive adoption of environmental management practices because firms experience reduced customer demands for their products or services if their environmental practices are questionable (Klassen and McLaughlin 1996; Kassinis and Soteriou 2003). Moreover, we may expect a positive relationship between customer centricity and adoption of environmental practices since customers exert constant pressure on firms to innovate in order to reduce their impact on the environment (Kleindorfer et al. 2005). The core of environmental management practices is to maintain close links with customers in order to identify their needs, receive feedback necessary for understanding if customer requirements are successfully met, and to determine whether to initiate relevant improvement activities (Delmas and Pekovic 2012). For instance, examining the combined effects of consumer, regulatory, and competitive pressures on the corporate sector's investment in environmental



innovation, Yalabik and Fairchild (2011) find evidence suggesting that consumers can drive environmental innovation especially if they are likely to switch due to environmental performance in a competitive market. Customer requirements have been identified as one of the main sources of environmental innovations, particularly with regard to products with improved environmental performance and process innovations that increase material efficiency, reduce energy consumption and waste and the use of dangerous substances (Foster and Green 2002). Additionally, the marketing literature underlines that customers benefit from firms' environmental strategies, stimulating them to implement environmental innovations (Kammerer 2009). Therefore, an environmentally responsible and customer-centric firm innovates to meet customer requirements for products and services and for environmental performance (Dibrell et al. 2011).

A few studies have found a positive relationship between customer satisfaction and adoption of environmental approaches (Grolleau et al. 2007; Delmas and Pekovic 2012). However, to our knowledge, there is no empirical evidence for the link between customer centricity and environmental practices, despite the theoretical rationale that supports a positive relationship with related concepts. The discussion above does not distinguish among the three dimensions of customer centricity identified above. In fact, we expect each dimension to have a positive effect on the adoption decision of environmental management practices, even if each dimension may have a different impact in magnitude. Consequently, we formulate the hypothesis as:

H<sub>1</sub>: Customer centricity – in terms of (a) its affective dimension, (b) its cognitive dimension and (c) the responsiveness dimension – has a positive effect on the likelihood of a firm to adopt environmental management practices early.

This general effect should occur regardless of the industrial context in which a firm operates. Nevertheless, the extent of the relationship is not expected to be identical in different contexts. We discuss next how the industrial context moderates the role of customer centricity.

### 2.3 The Moderating Role of Industrial Context

Three contextual factors have been shown to moderate the impact of customer centricity on the innovativeness or performance of the firm: munificence, competition and uncertainty. We

examine how each one can impact the strength of the link between customer centricity and the adoption of environmental practices.

***Munificence.*** The growth stage of the product life cycle is characterized by few competitors so that firms can concentrate on developing the market. The acquisition of new customers is relatively easy and so is their retention for repeat purchase businesses (Scherer 1980; Cooper 1984). However, customer information is indispensable at the early stages of growth to understand customers' behavior in terms of usage and as new segments of customers develop. It is the information processing of consumer data that matters the most at that stage. Moreover, as Delmas and Pekovic (2012) indicate, firms will rather invest in environmental innovations in periods of market expansion since there are more opportunities for innovation to emerge. We therefore anticipate that in periods of munificence/market growth, customer centricity as information processing will result in greater adoption of environmental practices.

H<sub>2</sub>: The higher the munificence/growth of the market, the more firms that have high levels of customer centricity as information processing (cognitive) will adopt environmental practices early.

***Competition.*** Even if investigated in several studies (e.g., Narver and Slater 1990; Gatignon and Robertson 1993; Gatignon and Xuereb 1997), the empirical evidence of the impact of competitive orientation on innovations is not conclusive (Han et al. 1998). Administrative innovations may not differ from product and service innovations brought to market by companies. However, in the specific area of corporate social responsibility (of which environmental concerns is one facet), such policies are more effective in less differentiated markets (Hull and Rothenberg 2008). This suggests that firms use these policies to differentiate from competitors, which they can only do if they are aware of the needs of their customers (i.e., if they are customer-centric). This results from strategic choices that are based on information collected from customers. Consequently, we hypothesize that:

H<sub>3</sub>: Customer-centricity as information processing (cognitive) will lead to a stronger probability of early adoption of environmental management practices in highly competitive market contexts.

**Uncertainty.** How does a firm behave when facing uncertain markets? There is ambiguity in the literature as to the question of when customer centricity is more effective. Customer centricity can play a significant role on the effectiveness of innovations in the market place. Indeed, customer centricity can be more effective in uncertain markets (Gatignon and Xuereb 1997). However Grinstein (2008), in a meta-analysis of the effect of market orientation on innovation consequences, conclude for a decline in the role of customer centricity as the environment becomes more turbulent. It is theoretically critical, however, to distinguish among the different types of customer centricity we have identified. It is in turbulent contexts that information becomes particularly useful to reduce uncertainty (Gotteland and Boulé 2006). Additionally, the uncertain market is also considered as unstable market (Glazer and Weiss 1993). Hence, under conditions of high market instability, the sensitivity of information is high since the value of received information tends to depreciate quickly (Dess et al. 1984; Glazer and Weiss 1993). Therefore, it is not so much the value dimension of customer centricity, nor the ability to be responsive to customer claims that matters but it is the ability to collect, analyze and disseminate information quickly through the organization. Customer centricity as an information processing capability reinforces the importance of information to reduce uncertainty in turbulent environment. In contrast, consistent with Grinstein (2008), consumer centricity as a value could be less effective as a means to anticipate future customer needs in turbulent environment. Although their dependent variable is not innovation adoption, this is consistent with the finding by Martin-Tapia et al. (2008) that proactive environmental strategies are less likely to result in larger exports in markets that are perceived as highly uncertain. Indeed, the implication is that firms are then less likely to adopt proactive environmental policies. This is in fact what Rueda-Manzanares et al. (2008) show: “the influence of the stakeholder integration capability is much greater for low levels of perceived complexity” (p. 196). Customers are key stakeholders and customer centricity increases the level of integration of their perspectives and considerations. Consequently, we hypothesize:

H<sub>4</sub>: Firms that exhibit high levels of customer centricity as information processing (cognitive) are more likely to adopt environmental management practices and the more so as the industry context is more uncertain.

Values and norms are general philosophical concerns that are important regardless of the environment although their general character may be implemented in different ways under

different industrial contexts. The ability to respond to customer claims may be more critical in some industry context where competition is intense and less so in growing markets where demand is abundant. However, it can be argued that in today's contexts where the communication between the customer and the manufacturer or service provider is facilitated by technology and where customers are expecting fast responses, these industry contexts may not put additional pressures on firms. Consequently, we do not develop specific moderating hypotheses regarding the affective and responsiveness dimensions of customer centricity. Nevertheless, we will investigate empirically the extent to which industrial context affect their importance.

### **3 Empirical analysis**

#### 3.1 The databases

The data for analysis were gathered from three cross-sectional French national databases. The *Organizational Changes and Computerization survey*<sup>2</sup> (COI) is a matched employer/employee survey on organizational change and computerization conducted by researchers and statisticians from the National Institute for Statistics and Economic Studies, the Ministry of Labor and the Center for Labor Studies. The questionnaire is self-administrated and describes work organizational practices in 2006 and changes that have occurred since 2003. The *Community Innovation Survey*<sup>3</sup> was conducted by the French Institute for Statistics and Economic Studies over the period 2006–2008 and is based on the Oslo Manual of the OECD. The *Annual Firm Survey*<sup>4</sup> (EAE) is an annual survey conducted by the French Institute for Statistics and Economic Studies.

We merged data from these three sources to obtain a cross-sectional data set consisting of 4324 firms with 10 or more employees. This merged data set includes firm characteristics, firm practices, and technological and organizational changes in various industries. Employing these three databases permitted us to work on a larger representative sample of firms and to control for a very detailed set of firm characteristics and features to properly isolate the effect of customer centricity on environmental procedure adoption.

---

<sup>2</sup> More details about the design and scope of this survey are available at [www.enquetecoi.net](http://www.enquetecoi.net): Survey COI-TIC 2006-INSEE-CEE/Treatments CEE.

<sup>3</sup> Survey details are available at <http://www.insee.fr/fr/methodes/default.asp?page=sources/sou-enq-communaut-innovation-cis.htm>.

<sup>4</sup> Survey details are available at <http://www.insee.fr/fr/methodes/default.asp?page=definitions/enquete-annuelle-entreprises.htm>.

### 3. 2 Dependent and Independent Variables

In this section, we describe the variables from the merged data base that represent the concepts involved in the hypotheses.

*Environmental Management Practices.* To measure environmental management practices, we use the variable denoted *Environmental Management Procedures*, which is a binary variable, coded 1 if the firm has implemented, after 2006, procedures to regularly identify environmental impacts (e.g., preparing environmental audits, setting environmental performance goals, ISO 14001 certification, etc.).

*Customer information processing.* In order to estimate the impact of customer information processing on the firm's probability to implement environmental practices, we create a variable *Customer information processing* that consists of five items from the COI 2006 survey: the firm (i) has used tools to study client expectations, behavior or satisfaction; (ii) has adopted integrated IT-CRM; (iii) has had central databases for sales or distribution. (iv) has had internal and (v) external departments focused on improving customer relations management.

*Responsiveness.* The responsiveness component consists of two items from the COI survey: the firm (i) has been engaged to respond to claims or supply after-sales service to a fixed deadline; or has operated a contact or call center for clients.

*Values and norms.* Values and norms, the cultural components of customer centricity follow the system-based perspective of Becker and Homburg (1999), in which "management systems are designed to promote a business organization's orientation toward its customers" (p. 18). Those systems can increase the level of a firm's customer centricity and can enhance the implementation of the principle of customer centricity within the organization. In our study, the focus is on quality management systems such as ISO 9000. Such systems rely explicitly on the notions of customer expectations, starting with identification of needs, through all the other processes of the quality management system and customer-focused policies. Therefore, we use the fact that the firm has adopted the ISO 9000 standards (a dichotomous variable) to indicate that the firm values its customers.

*Munificence/Market Growth.* The growth of the market is measured by an indicator variable that reflects whether the market of the firm's main activity has been growing since 2003, if it has been declining or if has been stagnant. Although our hypothesis only distinguishes between firms whose market is growing as opposed to being stagnant or

declining. Therefore, we considered all three possibilities by creating two dummy variables: the “market growth” dummy equals 1 if the market of the firm’s main activity has been going down since 2003 and 0 otherwise; the “market down” dummy takes the value 1 if the market size has decreased and 0 otherwise. This allows us to contrast the market growth condition with the other two market conditions. In addition to the moderating hypothesis, Delmas and Pekovic (2012) show that firms are more likely to invest in green practices when market is growing. Therefore, we specify “market growth” and “market down” as a main effect as well as a moderator effect such as suggested by hypothesis 2. .

*Competition/Competitive Intensity.* Competitive intensity is measured by a variable representing whether the firm has been affected by intensive competition on the market. The variable is coded from (1) representing not very strongly affected, to (4) very strongly affected. This variable is also specified as a main effect, consistent with the prior literature that has shown that competitive intensity decreases firm’s innovation activities (e.g., Narver and Slater 1990; Gatignon and Robertson 1993; Gatignon and Xuereb 1997).

*Market Uncertainty.* Market uncertainty is measured by a variable coded from (1) representing not very strongly affected, to (4) very strongly affected. High-level market uncertainty decreases the number of managers willing to integrate green initiatives in their firms because they face a high risk (e.g., Aragón-Correa and Sharma 2003; López-Gamero et al. 2011). Therefore, we include a variable representing whether the firm has been affected by market uncertainty as a main effect as addition to its moderating effect.

The moderating effects are estimated by specifying product terms reflecting the interactions. To facilitate interpretation of the moderating effects, the variables of market uncertainty and competition are mean-centered. Consequently, the corresponding coefficients of the variable with which it interacts will reflect the effect of that variable at the mean level of the moderator. The dummy variable for market growth is used for the product term so that the effect of the customer centricity variable can be interpreted as the effect of that variable when the market is not growing.

### 3.3 Control Variables

Following previous studies (e.g., Gatignon and Xuereb 1997; Grolleau et al. 2007), we include several control variables that are considered to be important drivers of firm’s probability to implement environmental management practices.

*Size.* Size tends to be positively correlated with firms' probability to adopt environmental practices due to financial, managerial and qualified human resources, economies of scale and 'learning by doing' (e.g., Grolleau et al. 2007; 2012). Hence, we introduce firm size in our model, as measured by a continuous variable representing the number of employees in the firm.

*Holding.* Following Grolleau et al. (2007; 2012), we presume that being a part of a holding could impact positively adoption of environmental management practices. Therefore, we include a dummy variable that has a value of 1 if the firm belongs to a holding.

*Export.* From a signaling perspective, firms that have distant customers will more likely need to prove their environmental commitment (Grolleau et al. 2007). Hence, export-oriented firms are more likely to invest in different environmental customer innovation practices (Brunnermeier and Cohen 2003). We use a variable representing the firm's volume of exports divided by the firm's sales.

*Sector of activity.* In order to control for sectorial differences, we introduce nine dummy variables to reflect the firm' activity: food industry, consumption goods, cars and equipment, intermediate goods and energy, construction, commercial, transport, financial and real-estate activities, and services for firms and services for individuals. This classification corresponds to the coding defined by the French National Institute for Statistics and Economic Studies.<sup>5</sup>

The variables used in the model specification described above, their definitions and sample statistics are presented in Table 1.

\*\*\*

[Insert Table 1 about here]

\*\*\*

### 3. 4 Empirical Model

We specify a linear model for the underlying latent variable driving a firm's probability to invest in environmental management practices:

$$Y_i^* = \beta + \sum_{k=1}^3 \alpha_k x_{ik} + \sum_{s=1}^4 \gamma_s m_{is} + \sum_{r=1}^4 \lambda_r c_{ir} + \sum_{k=1}^2 \sum_{s=1}^4 \eta_{ks} x_{ik} m_{is} + u_i \quad (1)$$

---

<sup>5</sup> <http://www.insee.fr/en/methodes/default.asp?page=nomenclatures/naf2008/naf2008.htm>

where  $x_{ik}$  represents three components of customer centricity,  $k$  differentiates between customer information processing, capacity to be responsive and values and norms;  $m_{is}$  represents the industrial context variables where  $s$  distinguishes between market growth, market down, competitive intensity and market uncertainty;  $c_{ir}$  represents our control variables such as size, holding, export and sector activity;  $x_{ik}m_{is}$  represents the interactions between the of components customer information processing and market characteristics (market growth, market down, competitive intensity and market uncertainty).  $\alpha, \gamma, \lambda, \eta$  are slope coefficients to be estimated and  $\beta$  and  $u$  are the intercept and the disturbance term, respectively. The model of firms' choice to adopt environmental management practices is stated as a discrete-choice model, with the dummy variables indicating environmental management practices as the dependent variables  $Y_i$ :

$$\begin{aligned} Y_i &= 1 \quad \text{if } Y_i^* > 0, \\ Y_i &= 0 \quad \text{otherwise.} \end{aligned} \quad (2)$$

Assuming a logistic distribution for  $u$ , we maximize the log-likelihood of the logit model (Greene 2002) to estimate our model parameters up to a positive constant.

#### 4 Results

The correlation matrix of the components of customer centricity is reported in Table 2 as well as the correlations among all the predictor variables, including the interaction terms. No problem of multicollinearity was detected. The Logit model estimation results are presented in Table 3. The fit is reasonably good with an adjusted pseudo R-squared of 16% ( $p < 0.001$ ).

\*\*\*

[Insert Tables 2 and 3 about here]

\*\*\*

In Table 3, we observe that the variables representing customer information processing and value and norms are positive and significant ( $\alpha = 0.32, p < .001$ ;  $\alpha = 0.84, p < .001$ , respectively), indicating that firms with high customer information processing and value and norms are more likely to adopt environmental management practices. These results



are in line with prior empirical evidence (e.g., Grolleau et al. 2007; Kammerer 2009; Dibrell et al. 2009; Yalabik and Fairchild 2011) that argues that highly customer-centric firms continuously anticipate and adapt environmental innovative policies in order to maintain close link with their customers. Therefore, we suggest that customers' green orientation is one of the drivers of firm's investment in environmental innovation (Kleindorfer et al. 2005). However, the variable that corresponds to the responsiveness is insignificant ( $\alpha = 0.06$ ,  $t = 0.19$ ). This could be explained by the fact that firm's responsiveness is more oriented to technical satisfaction of the customer rather than identification of customers' needs. Therefore, if a firm focuses only on this dimension of customer centrality, it is unable to receive the necessary feedback in order to understand customers' sensitivity to the environment. Consequently, we are able to confirm only partly hypothesis H<sub>1</sub>.

The firm's investment in customer information processing under highly competitive market increases a firm's probability to invest in environmental management practices, which confirms hypothesis H<sub>3</sub> ( $\eta = 0.13$ ,  $p < .05$ ). This is consistent with previous studies indicating that environmental management practices can help highly customer-centric firms to differentiate themselves from their competitors (Hull and Rothenberg 2008). Similarly, in high competitive contexts, firms are likely to exhibit high strategic orientation differentiation (Deshpandé et al. 2012), which could be achieved by implementing environmental management standards. Thus, we suggest that competitive threat increases a firm's probability to adopt green innovation. On the other hand, if competitive pressures are low, previously established cost and differentiated advantages are considered to be sufficient for firms to compete on the market without paying particular attention to environmental issues.

The interaction terms involving conditions when the market is growing, market is going down or highly uncertain are not significant. Therefore, we fail to find support for hypotheses H<sub>2</sub> and H<sub>4</sub>. This appears to indicate that when the market is growing/down, it is easier for firms to acquire and retain customers without additional investment such as green innovations. Similarly, uncertainty demands greater caution so that firms do not commit to green action investments. Therefore, we may conclude that when firms are confronted to growth or uncertainty, they can consider information-processing based customer centrality sufficient to compete on the market. Consequently investment in environmental practices is considered more as additional cost and firms then prefer to invest in other customer strategies.

Some of the control variables are associated with the adoption of environmental practices. As expected, variables that represent firm size and volume of export are positively associated with environmental management practices adoption (e.g., Grolleau et al. 2007)

while operating under uncertain market will decrease this probability (e.g., Aragón-Correa and Sharma 2003; López-Gamero et al. 2011). Finally, because each sector produces different externalities, the magnitude of pressure from customer concerning the environment is also different. Several sectors are found to be more sensitive to environmental management procedure implementation such as food-processing, consumption goods, cars and equipment, intermediate goods and energy, construction and transport. The results are in line with Grolleau et al. (2007) that indicate that firms in more regulated and monitored sectors (e.g., food-processing, cars and equipment, intermediate goods and energy) are more likely to integrate environmental management practices in order to benefit from regulatory relief.

## **5 Discussion and conclusion**

Environmental management practices have a particular appeal to customer centric firms. The literature confirmed a positive relationship between customer satisfaction and adoption of environmental management practices (e.g., Grolleau et al. 2007; Delmas and Pekovic 2012). However, even the literature that has analyzed determinants of environmental management practices adoption (e.g., Grolleau et al. 2007) has not explored the role of customer centricity. Therefore, in conformity with our objective, this study provides evidence on the effect of three components of customer centricity, namely customer information processing, responsiveness and values and norms on the adoption of environmental management practices. Moreover, the current study adds to the literature on how external market factors moderate the relationship between customer centricity and environmental management practices.

Our results show that two components of customer centricity, customer information processing and values and norms, exert a positive influence on a firm's decision to adopt environmental management practices. This finding is consistent with previous work (e.g., Grolleau et al. 2007; Kammerer 2009; Dibrell et al. 2009; Yalabik and Fairchild 2011) that identifies customer satisfaction as an important driver of environmental management practices implementation. However, while much of the customer satisfaction literature has focused on the need for firms to be responsive to their customers complains and feedback, our findings indicate that responsiveness as one of customer centricity components does not influence a firm's decision to adopt environmental management practices. The rational for such findings may be based on the fact that technical components of customer centricity are not sufficient to drive firms to invest in environmental management practices.

Additionally, our study analyzes if the effects of customer centricity on environmental management practices adoption are contingent on the levels of market growth, market down, market competition and market uncertainty. The results show that customer information processing is a stronger driver of firm's decision to adopt environmental management practices when market competition is high than when it is low. This supports findings from formerly referenced studies that indicate that in highly competitive market green practices help firms to differentiate themselves from competitors and do enhance customer satisfaction. Contrary to expectations, no significant results were found regarding the moderating role of market growth/down and uncertainty on the relationship between customer centricity and environmental management practices. With respect to market growth/down, results indicate that firms do not need differentiation strategy in term of green practices in order to satisfy customers when market is growing. Firms facing highly uncertain markets have a hard time to predict the market. In such circumstances, additional investment would increase the chances that firms make the wrong decisions.

Our findings have direct practical implications. Through recognizing the importance and usefulness of customer centricity that affect not only the customer satisfaction but also firm's green investment, managers are advised to formulate the organizational strategies (in term of green practices investment) in line with their customer centricity. Additionally, these strategies should also be in accordance with the changes in external environment. Thus, managers who want to encourage the introduction of green practices to improve organizational effectiveness need to recognize external factors that suit their implementation.

There are limitations to the study that suggest further avenues for research. Some limitations are inherent to the measurement of the customer centricity components. Secondly, although our sample provides a large database of firms across many industries, extending the scope to multiple countries may reveal idiosyncrasies. Such work would focus on country differences, such as in Van Everdingen and Waarts (2003) that stresses the differences in innovation adoption among different countries. In the same sense, Deshpandé and Farley (2004) find significant differences across countries relating the effect of market orientation and innovation on firm performance. Therefore, we encourage further research of the relationship between customer centricity and environmental management practices to include data from other countries. Replications to different national settings would provide greater generalizability of our results and may add insight. Third, the scales used to measure market growth, competitive intensity and market uncertainty could be improved beyond the three or four-point scales used in this database. Fourth, we used cross-sectional data that, in spite of

using measure in two periods and many observable variables, may have introduced common method bias. Longitudinal panel data would provide the opportunity to investigate further the reliability of our results. Additionally, even if environmental management practices are mainly focused on customers, there are many additional stakeholders (such as governments, regulators, competitors, community and environmental interest groups, industry associations, employees) to be considered as well (Albuquerque et al. 2007). Therefore, future research should extend the customer centricity perspective to stakeholder centricity in order to investigate stakeholder pressure and adoption of environmental management practices.

Nevertheless, this investigation is a rare empirical analysis on a large-scale basis of how the adoption of environmental management practices depends on the type and level of customer-centricity of the firm. This contributes to confirm the importance of the role of customer-centricity of firms and of the environmental issues in response or in anticipation of customer demand.

## References

- Albuquerque P, Bronnenberg BJ, Corbett C (2007) A Spatio-Temporal Analysis of the Global Diffusion of ISO 9000 and ISO 14000 Certification. *Management Science* 53(3): 451-468.
- Aragón-Correa JA, Sharma S, (2003) A contingent resource-based view of proactive corporate environmental strategy. *Academy Management Review* 28(1): 71-88.
- Atuahene-Gima K, Slater SF, Olson EM (2005) The Contingent Value of Responsive and Proactive Market Orientations for New Product Program Performance. *Journal of Product Innovation Management* 22(6): 464-482.
- Bourgeois JC, Barnes JG (1979) Viability and Profile of the Consumerist Segment. *Journal of Consumer Research* 5: 217-228.
- Brunnermeier SB, Cohen MA (2003) Determinants of Environmental Innovation in US Manufacturing Industries. *Journal of Environmental Economics and Management* 45: 278-293.
- Cooper RG (1984) New Product Strategies: What Distinguishes the Top Performers? *Journal of Product Innovation Management* 2(2): 151-164.
- Craig CS, McCann JM (1978) Assessing Communication Effects on Energy Conservation. *Journal of Consumer Research* 5: 82-89.
- Damanpour F (1991) Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators. *The Academy of Management Journal* 34(3): 555-590.
- Damanpour F, Evan WM (1984) Organizational Innovation and Performance: The Problem of Organizational Lag. *Administrative Science Quarterly* 29: 392-409.
- Day GS (1994) The Capabilities of Market-Driven Organizations. *Journal of Marketing* 58 (4): 37-52.
- Delmas M, Pekovic S (2012) Sustainability and Market Conditions: The Resource Efficiency Paradox. Working paper, Institute of the Environment and Sustainability, UCLA.
- Deshpandé R, Webster FE Jr (1989) Organizational Culture and Marketing: Defining the Research Agenda. *Journal of Marketing* 53: 3-15.
- Deshpandé R, Farley JU, Webster FE Jr (1993) Corporate Culture, Customer Orientation, and Innovativeness in Japanese Firms: A Quadrad Analysis. *Journal of Marketing* 57: 23-27.
- Deshpande R, Farley J (2004) Organizational culture, market orientation, innovativeness, and firm performance: an international research odyssey. *International Journal of Research in Marketing* 21(1): 3-22.
- Deshpandé R, Grinstein A, Ofek E (2012) Strategic Orientations in Competitive Contexts: Consensus vs. Differentiation. *Marketing Letters* 23(3): 629-643.
- Dess GG, Beard DW (1984) Dimensions of organizational task environments. *Administrative Science Quarterly* 29(1): 52-73.
- Dibrell C, Craig J, Hansen E (2011) Firm Innovativeness: An Organizational Life Cycle Perspective. *Journal of Small Business Management* 49(3): 467-489.
- Dotson JP, Allenby GM (2010) Investigating the Strategic Influence of Customer and Employee Satisfaction on Firm Financial Performance. *Marketing Science* 29(5): 895-908.
- Drucker PF (1954) *The Practice of Management*. Harper & Row, New York.
- Foster C, Green K (2002) Environmental Innovation in Industry: The Importance of Environmentally-driven Users. *International Journal of Environmental Technology & Management* 2(4): 303-314.
- Frambach RT, Prabhu J, Verhallen TMM (2003) The Influence of Business Strategy on New Product Activity: The Role of Market Orientation. *International Journal of Research in Marketing* 20(4): 377-397.

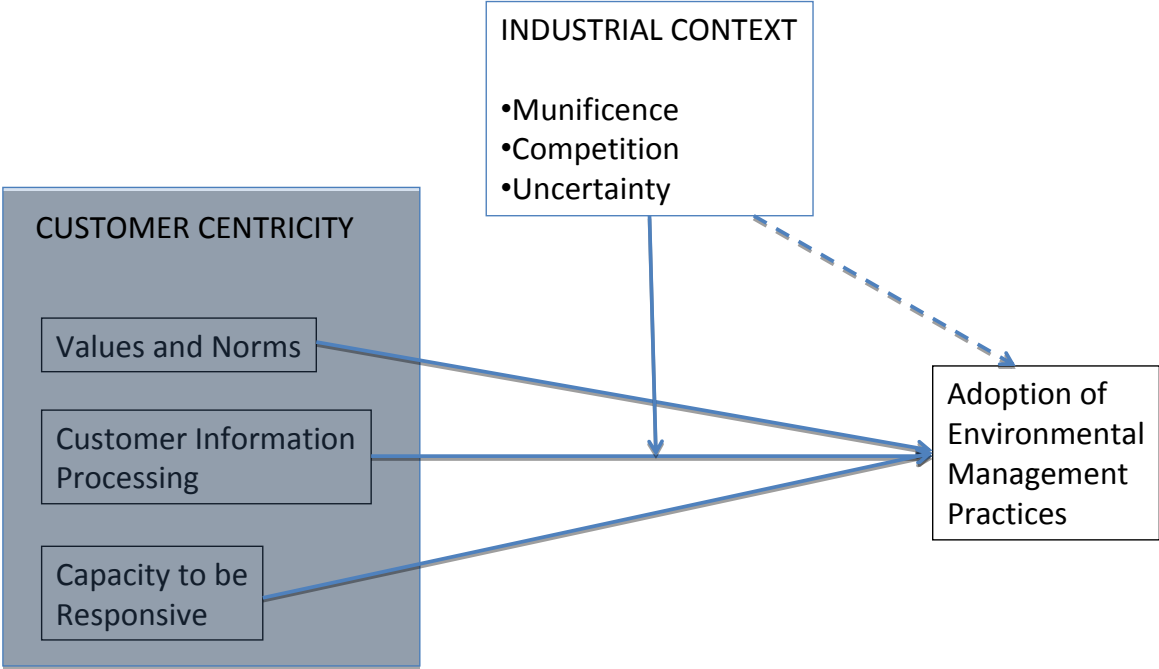
- Gatignon H, Robertson TS (1993) The Impact of Risk and Competition on Choice of Innovations. *Marketing Letters* 4(3): 191-205
- Gatignon H, Xuereb JM (1997) Strategic Orientation of the Firm and New Product Performance. *Journal of Marketing Research* 34(1): 77-90.
- Gelbrich K, Roschk H (2011a) Do Complainants Appreciate Overcompensation? A Meta-analysis on the Effect of Simple Compensation Vs. Overcompensation on Post-complaint Satisfaction. *Marketing Letters* 22(1): 31-47.
- Gelbrich K, Roschk H (2011b) A Meta-Analysis of Organizational Complaint Handling and Customer Responses. *Journal of Service Research* 14(1): 24-43.
- Ghose A, Han SP (2011) An Empirical Analysis of User Content Generation and Usage Behavior on the Mobile Internet. *Management Science* 57(9): 1671-1691.
- Ginsberg JM, Bloom PN (2004) Choosing the Right Green Marketing Strategy. *MIT Sloan Management Review* 46(1): 79-84.
- Glazer R, Weiss AW (1993) Marketing in Turbulent Environments: Decision Processes and the Time-Sensitivity of Information. *Journal of Marketing Research* 30(3): 509-521.
- Gotteland D, Boulé JM (2006) The Market Orientation–new Product Performance Relationship: Redefining the Moderating Role of Environmental Conditions. *International Journal of Research in Marketing* 23(2): 171-185.
- Greene WH (2002) *Econometric Analysis*. Prentice Hall, New Jersey.
- Grewal R, Tansuhaj P (2001) Building Organizational Capabilities for Managing Economic Crisis: The Role of Market Orientation and Strategic Flexibility. *Journal of Marketing* 65: 67-80.
- Grinstein A (2007) The Effect of Market Orientation and Its Components on Innovation Consequences: a Meta-analysis. *Journal of the Academy of Marketing Science* 36(2): 166-173.
- Grolleau G, Mzoughi N, Pekovic S (2007) Chemical Firms' Registration for the Responsible Care Program and the ISO 14001 Standard: A Comparative Approach. *Economics Bulletin* 12: 1-13.
- Grolleau G, Mzoughi N, Pekovic S (2012) Green Not (only) for Profit: An Empirical Examination of the Effect of Environmental-Related Standards on Employees' Recruitment. *Resource and Energy Economics* 34(1): 74-92.
- Han JK, Kim N, Srivastava RK (1998) Market Orientation and Organizational Performance: Is Innovation a Missing Link? *Journal of Marketing* 62(4): 30-45.
- Homburg C, Pflesser C (2000) A Multiple-Layer Model of Market-Oriented Organizational Culture: Measurement Issues and Performance Outcomes. *Journal of Marketing Research* 37(4): 449-462.
- Hoyer WD, Chandy R, Dorotic M, Krafft M, Singh SS (2010) Consumer Cocreation in New Product Development. *Journal of Service Research* 13(3): 283-296.
- Hunt CB, Auster ER (1990) Proactive environmental management: avoiding the toxic trap. *MIT Sloan Management Review* 31(2): 7-18.
- Hull CE, Rothenberg S (2008) Firm Performance: The Interactions of Corporate Social Performance with Innovation and Industry Differentiation. *Strategic Management Journal* 29: 781-789.
- Hurley RF, Hult GTM (1998) Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination. *Journal of Marketing* 62: 42-54.
- Kammerer D (2009) The Effects of Customer Benefit and Regulation on Environmental Product Innovation: Empirical Evidence from Appliance Manufacturers in Germany. *Ecological Economics* 68(8-9): 2285-2295.

- Kassinis GI, Soteriou AC (2003) Greening the Service Profit Chain: The Impact of Environmental Management Practices. *Production and Operations Management* 12: 386-403.
- Ketchen DJ Jr, Hult GTM, Slater SF (2007) Toward Greater Understanding of Market Orientation and the Resource-based View. *Strategic Management Journal* 28(9): 961-964.
- Kimberly JR, Evanisko MJ (1981) Organizational Innovation: The Influence of Individual, Organizational, and Contextual Factors on Hospital Adoption of Technological and Administrative Innovations. *Academy of Management Journal* 24(4): 689-713.
- Klassen RD, McLaughlin CP (1996) The Impact of Environmental Management on Firm Performance. *Management Science* 42 (8): 1199-1214.
- Kleindorfer PR, Singhal K, van Wassenhove LN (2005) Sustainable Operations Management. *Production and Operations Management* 14 (4): 482-492.
- Kohli AK, Jaworski BJ (1990) Market Orientation: The Construct, Research Propositions Managerial Implications. *Journal of Marketing* 54(2): 1-18.
- Labay DG, Kinnear TC (1981) Exploring the Consumer Decision Process in the Adoption of Solar Energy Systems. *Journal of Consumer Research* 8(3): 271-278.
- Langerak F, Hultink EJ, Robben HSJ (2007) The Mediating Role of New Product Development in the Link Between Market Orientation and Organizational Performance. *Journal of Strategic Marketing* 15(4): 281-305.
- Leonard-Barton D (1981) Voluntary Simplicity Lifestyles and Energy Conservation. *Journal of Consumer Research* 8: 243-252.
- López-Gamero MD, Molina-Azorín JF, Claver-Cortés E (2011) Environmental Uncertainty and Environmental Management Perception: A Multiple Case Study. *Journal of Business Research* 64(4): 427-435.
- Martin-Tapia I, Aragon-Correa JA, Senise-Barrio ME (2008) Being Green and Export Intensity of SMEs: The Moderating Influence of Perceived Uncertainty. *Ecological Economics* 68(1-2): 56-67.
- Narver JC, Slater SF (1990) The Effect of a Market Orientation on Business Profitability. *Journal of Marketing* 54 (4): 20-35.
- Narver JC, Slater SF, Douglas LM (2004) Responsive and Proactive Market Orientation and New-Product Success. *Journal of Product Innovation Management* 21(5): 334-347.
- Noble CH, Sinha RK, Kumar A (2002) Market Orientation and Alternative Strategic Orientations: A Longitudinal Assessment of Performance Implications. *Journal of Marketing* 66(4): 25-39.
- OECD (2009a) Sustainable Manufacturing and Eco-Innovation: Framework, Practices and Measurement.
- OECD (2009b) Sustainable Manufacturing and Eco-innovation: Towards a Green Economy. *Journal of Health and Social Behavior*.
- Parsons AJ (1991) Building Innovativeness in Large U.S. Corporations. *Journal of Services Marketing* 5(4): 5-20
- Pekovic S (2010) The Determinants of ISO 9000 Certification: A Comparison of the Manufacturing and Service Sectors. *Journal of Economic Issues* 44(4): 895-914.
- Ransbotham S, Kane GC, Lurie NH (2012) Network Characteristics and the Value of Collaborative User-Generated Content. *Marketing Science* 31(3): 387-405.
- Rueda-Manzanares A, Aragón-Correa JA, Sharma S (2008) The Influence of Stakeholders on the Environmental Strategy of Service Firms: The Moderating Effects of Complexity, Uncertainty and Munificence. *British Journal of Management* 19(2): 185-203.
- Scherer FM (1980) *Industrial Market Structure and Economic Performance*. Rand McNally, Chicago.

- Sheth JN, Sisodia RS, Sharma A (2000), The Antecedents and Consequences of Customer-Centric Marketing. *Academy of Marketing Science*, 28 (1) (2000): 55-66.
- Subramanian A, Nilakanta S (1996) Organizational innovativeness: exploring the relationship between organizational determinant of innovation, types of innovations and measures of organizational performance. *Omega* 24(6): 631-47.
- Swami S (2006) Research Perspectives at the Interface of Marketing and Operations: Applications to the Motion Picture Industry. *Marketing Science* 25(6): 670-673.
- Troye SV, Supphellen M (2012) Consumer Participation in Coproduction: 'I Made It Myself' Effects on Consumers' Sensory Perceptions and Evaluations Of. *Journal of Marketing* 76: 33-46.
- Utterback JM, Abernathy WJ (1975) A dynamic model of process and product innovation. *Omega* 33(6): 639-656.
- van Everdingen YM, Waarts E (2003) The influence of national culture on the adoption status of innovation. *Marketing Letters* 14(3): 217-232.
- Verhallen TMM, van Raaij WF (1981) Household Behavior and the Use of Natural Gas for Home Heating. *Journal of Consumer Research* 8: 253–257.
- von Hippel E (1978) Successful Industrial Products from Customer Ideas: Presentation of a New Customer-Active Paradigm with Evidence and Implications. *Journal of Marketing* 42 (1): 39-50.
- Wensley R (1995) A Critical Review of Research in Marketing. *British Journal of Management* 6(6): 63-82.
- Yalabik B, Fairchild RJ (2011) Customer, Regulatory, and Competitive Pressure as Drivers of Environmental Innovation. *International Journal of Production Economics* 131(2): 519-527.



**Figure 1: Conceptual Framework**



**Table 1: Definition of variables and sample statistics**

<b>Variable</b>	<b>Description</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
<b>Dependent variables</b>					
Environmental Management Practices	The firm has implemented, after 2006, procedures to regularly identify and environmental impacts (e.g., preparing environmental audits, setting environmental performance goals, ISO 14001 certification, etc.). Dummy variable (= 1 if yes)	0.35	--	--	--
<b>Independent variables</b>					
Customer information processing	Composite scale: (1) In design (R&D) or marketing, the firm has used tools to study client expectations, behavior or satisfaction; (2) the firm has used integrated I.T. management of customer relationships; (3) the firm has had central databases for sales or distribution; (4) since 2003, the firm has internal and external department related to client relations.	2.78	1.45	0.00	5.00
Responsiveness	Composite scale: (1) The firm has been engaged to respond to claims or supply after-sales service to a fixed; (2) the firm has operated a contact or call center for clients.	0.78	0.41	0.00	1.00
Values and norms	Registered with ISO 9000, EAQF, etc. Dummy variable (=1 if registered in 2006)	0.61	--	--	--
Market Growth	The firm's main market has been going up since 2003. Dummy variable (= 1 if yes)	0.33	--	--	--
Market Down	The firm's main market has been going down since 2003. Dummy variable (= 1 if yes)	0.20			
Competitive Intensity	Since 2003, the firm has been affected by new competitors on the market. (1), not very strongly affected, to (4), very strongly affected	2.35	0.80	1.00	4.00
Market Uncertainty	Since 2003, the firm has been	2.68	0.79	1.00	4.00

	affected by uncertainty on the market.				
	(1), not very strongly affected, to (4), very strongly affected				
Size	Number of employees.	2533	913	16.00	111956
Holding	The firm belonged to a holding group in 2003.	0.79	0.40	0.00	1.00
	Dummy variable (= 1 if yes)				
Export	Exports as share of total Euro sales	0.14	0.24	0.00	0.99

**Table 2a: Components of customer centricity correlation coefficients**

	Customer information processing	Responsiveness	Values and Norms
Customer information processing	1.00	-	-
Responsiveness	0.34	1.00	-
Values and Norms	0.08	0.15	1.00

**Table 2b: Correlation matrix of variables included in model<sup>a</sup>**

Environmental Management Practices	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer information processing	0.20	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Responsiveness	0.11	0.31	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Values and Norms	0.28	0.13	0.17	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Market Growth	0.16	0.09	0.09	0.09	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Market Down	-0.06	-0.01	-0.00	-0.10	-0.36	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Competitive Intensity	-0.02	0.07	0.05	0.01	0.02	0.06	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Market Uncertainty	-0.03	0.09	0.07	0.04	-0.15	0.26	0.28	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-
Customer information processing x Growth	-0.01	-0.08	-0.04	-0.02	-0.00	-0.05	0.02	-0.06	1.00	-	-	-	-	-	-	-	-	-	-	-	-
Customer information processing x Competition	0.04	-0.04	-0.06	-0.03	0.03	0.03	-0.06	-0.08	0.05	1.00	-	-	-	-	-	-	-	-	-	-	-
Customer information processing x Uncertainty	-0.01	0.02	-0.08	-0.03	-0.04	-0.06	-0.07	-0.13	-0.15	0.31	1.00	-	-	-	-	-	-	-	-	-	-

<sup>a</sup> Excluding the dummy variables for sector of activity

**Table 3: The effect of Customer Centricity components on Environmental Management Practices**

Variables	Environmental Management Practices
Customer information processing ( $\alpha_1$ )	0.33***
	(0.06)
Responsiveness ( $\alpha_2$ )	0.06
	(0.19)
Values and norms ( $\alpha_3$ )	0.85***
	(0.17)
Market Growth ( $\gamma_1$ )	0.47***
	(0.16)
Market Down ( $\gamma_2$ )	0.54
	0.40
Competitive Intensity ( $\gamma_3$ )	-0.09
	(0.09)
Market Uncertainty ( $\gamma_4$ )	-0.21*
	(0.10)
Customer information processing x Market Growth ( $\eta_1$ )	-0.07
	(0.12)
Customer information processing x Market Down ( $\eta_2$ )	-0.10
	(0.13)
Customer information processing x Competitive Intensity ( $\eta_3$ )	0.13*
	(0.07)
Customer information processing x Market Uncertainty ( $\eta_4$ )	-0.06
	(0.07)
Size ( $\lambda_1$ )	0.00*
	(0.00)
Holding ( $\lambda_2$ )	0.21
	(0.18)
Export ( $\lambda_3$ )	1.35***
	(0.34)
Agrifood ( $\lambda_4$ )	0.69***
	(0.26)
Consumption goods ( $\lambda_5$ )	0.59*
	(0.32)
Cars and Equipments ( $\lambda_6$ )	0.68***
	(0.29)
Intermediate goods and energy ( $\lambda_7$ )	1.03***
	(0.25)
Construction ( $\lambda_8$ )	2.02***
	(0.30)
Transport ( $\lambda_9$ )	0.75***

	(0.30)
Financial and real estate ( $\lambda_{10}$ )	0.32
	(0.43)
Services for firms and individuals ( $\lambda_{11}$ )	0.23
	(0.23)
Constant ( $\beta$ )	-2.66***
	(0.37)
Pseudo R2	0.16
Observations	4,324

(\*), (\*\*), (\*\*\*) indicate significance at the 0.10, 0.05 and 0.01 level respectively.

Europe Campus  
Boulevard de Constance  
77305 Fontainebleau Cedex, France  
Tel: +33 (0)1 60 72 40 00  
Fax: +33 (0)1 60 74 55 00/01

Asia Campus  
1 Ayer Rajah Avenue, Singapore 138676  
Tel: +65 67 99 53 88  
Fax: +65 67 99 53 99

Abu Dhabi Campus  
Muroor Road - Street No 4  
P.O. Box 48049  
Abu Dhabi, United Arab Emirates  
Tel: +971 2 651 5200  
Fax: +971 2 443 9461

[www.insead.edu](http://www.insead.edu)

**INSEAD**

The Business School  
for the World®