



European Journal of Marketing

Customer orientation and firm's business performance: A moderated mediation model of environmental customer innovation and contextual factors

Sanja Pekovic Sylvie Rolland

Article information:

To cite this document:

Sanja Pekovic Sylvie Rolland , (2016), "Customer orientation and firm's business performance A moderated mediation model of environmental customer innovation and contextual factors ", European Journal of Marketing, Vol. 50 Iss 12 pp. 2162 - 2191

Permanent link to this document:

<http://dx.doi.org/10.1108/EJM-08-2015-0584>

Downloaded on: 09 January 2017, At: 01:35 (PT)

References: this document contains references to 106 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 193 times since 2016*

Users who downloaded this article also downloaded:

(2016), "A contingency model of marketing dashboards and their influence on marketing strategy implementation speed and market information management capability", European Journal of Marketing, Vol. 50 Iss 12 pp. 2077-2102

(2016), "Troubled waters: the transformation of marketing in a digital world", European Journal of Marketing, Vol. 50 Iss 12 pp. 2103-2133

Access to this document was granted through an Emerald subscription provided by emerald-srm:172715 []

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.

Customer orientation and firm's business performance

A moderated mediation model of environmental customer innovation and contextual factors

Sanja Pekovic

University of Montenegro, Podgorica, Montenegro, and

Sylvie Rolland

Université Paris-Dauphine, PSL Research University, Paris, France

Abstract

Purpose – The purpose of this study is to develop a better theoretical and empirical understanding of the causal and contextual mechanisms explaining the relationship between customer orientation and business performance.

Design/methodology/approach – A three-stage least squares model was used on a sample of 3,720 French firms with 20 or more employees.

Findings – By using a moderated mediation approach, it was found that the mediating effect of environmental customer innovation on the relationship between customer orientation and business performance under different contextual factors (market environment, firm size and sector of activity) can be significantly stronger or weaker.

Research limitations/implications – This analysis is restricted by the choice of one particular country, and further research should use data from other countries to develop a general understanding of the issues examined. Additionally, examining relevant mechanisms other than firm performance measures will advance the understanding of the customer orientation–firm performance linkage. Because of the fact that the majority of variables used are binary and that each survey was conducted in a particular situation and in a particular context, the picture portrayed could be biased. Because environmental issues not only concern consumers but also all other market actors, it would be highly useful to verify the obtained results using broader concepts such as Hult's (2011) "market orientation plus" concept or the "sustainable market orientation" developed by Mitchell *et al.* (2010).

Practical implications – According to the results, to achieve market success and sustain a competitive advantage, managers must simultaneously invest in customer orientation and innovation performance. Additionally, managers should consider market environment, firm size and sector of activity as important contingencies in their decision of whether to invest in customer orientation.

Originality/value – This study makes an important contribution by opening up a "black box" and offers a deeper perspective on how and why customer orientation affects firm performance. In particular, rather than providing separate analyses of mediating and moderating effects, this study proposes a simultaneous analysis that reveals how and under what conditions customer orientation improves business performance.

Keywords Sustainable development, Contingency theory, Customer orientation, Empirical research

Paper type Research paper



Introduction

New consumer behavior has emerged because of the global economic crisis (Ang *et al.*, 2000). Consumers have become more economical, responsible and demanding (Flatters and Willmott, 2009). Therefore, to enhance their business performance, firms have become more customer-oriented, as investment in customer orientation is considered to offer the best value proposition in a very competitive environment (Lusch and Webster, 2010).

However, some literature studies suggest that a better understanding of how customer orientation enhances firms' effectiveness can be achieved by examining mediating factors (Huhtala *et al.*, 2014; Hughes *et al.*, 2008; Matsuo, 2006; Han *et al.*, 1998; Deshpandé *et al.*, 1993). Recent attention to the increasing dynamism of competition in the market, globalization and technological development points to innovation as a potential mediator of the relationship between customer orientation and firm performance (Huhtala *et al.*, 2014; Han *et al.*, 1998; Deshpandé *et al.*, 1993). However, the present study is, to our knowledge, the first to empirically examine the effect of a specific type of innovation-based strategy for environmental sustainability, i.e. environmental customer innovation, in the relationship between customer orientation and a firm's business performance. This type of innovation includes all the changes in product ranges or production processes that are related to sustainability targets (De Marchi, 2012) and can occur during production of a good or service, or during the aftersales use of a good or service by the end user (Horbach and Rennings, 2013; Horbach *et al.*, 2012). Because in this paper we are interested in analyzing eco-innovation with a significant effect on the customer, we only consider innovation delivering environmental benefits associated with end users.

Although prior studies have introduced innovation as mediating variables between customer orientation and business performance link, they have so far failed to take into account how moderating variables might affect these relationships. Marketing researchers have in fact called for the analysis of possible moderators with regard to the link between market orientation and firm's business performance (Slater and Narver, 1994; Greenley, 1995; Kumar *et al.*, 1998; Appiah-Adu, 1998; Harris, 2001; Homburg *et al.*, 2007; Kumar *et al.*, 2011). Identifying moderators can help understand the circumstances and processes through which customer orientation is related to improved business performance. Although environmental customer innovation mediates the link between customer orientation and business performance, this does not necessarily imply that customer orientation will uniformly benefit the firm, as it may depend on internal and external contextual factors. In particular, scholars have underlined the importance of market environment (market growth, competitive intensity and market uncertainty), firm size and sector of activity as potential moderators. Therefore, the effect of customer orientation on a firm's business performance may be modeled both in terms of mediating and moderating factors. In this vein, we propose a model in which environmental customer innovation mediates the relationship between customer orientation and firm's business performance, but the strength of this association is moderated by contextual factors. Therefore, our study deepens the perspectives of the current literature by providing a holistic framework combining the mediating and moderating effects, revealing *how* and *under what conditions* customer orientation improves business performance (Figure 1). It should be noted that business performance refers to financial performance as measured by the logarithm of the firm's sales.

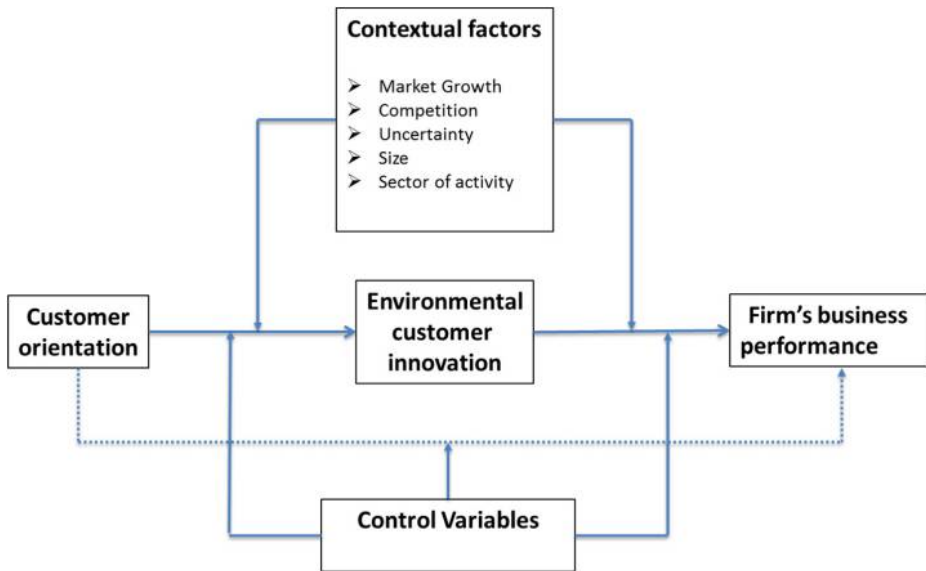


Figure 1.
Moderated mediation
model of
environmental
customer innovation
and contextual
factors

Note: The dotted lines represent direct effects that may be fully mediated/moderated/mediated and moderated

The present research is intended to contribute to the existing literature in several ways. First, we examine how customer orientation influences perceived performance in terms of green benefits for customers. Second, although scholars have so far examined either the moderating or mediating factors in the relationship between customer orientation and firm's business performance, we empirically test all relationships within one moderated mediation model. In this paper, we want to further show that the mediated relationship between customer orientation and a firm's business performance is more complicated, as it could vary depending on the contextual factors considered. Taking a contextual approach is essential, as it provides a complete picture of how firms behave in different contextual situations. Accordingly, this paper underlines the importance of incorporating potential mediators and moderators into a single framework to help disentangle the complexity and provide a more insightful understanding than previous studies. The third contribution of our research comes from the use of the Organizational Changes and Computerization survey (COI, 2006), Community Innovation Survey (CIS8, 2006-2008) and the Annual Firm Survey (EAE, 2003). Using these three databases allowed us to work on a larger representative sample of French firms with more than 20 employees ($N = 3,720$). We were able to therefore control for a very detailed set of firm characteristics and features to properly isolate the mediating effect of environmental customer innovation in the relationship between customer orientation and firm performance, to address reverse-causality issues, and to properly correct for the endogeneity of customer orientation and environmental customer innovation variables. Finally, using a French database is appealing because prior empirical studies on customer orientation and firm's business performance have referred mainly to experiences in Anglo-Saxon countries.

This paper is organized as follows. In the second section, we review the relevant literature and develop the hypotheses. In the third section, we describe our empirical strategy. The fourth section describes our results. A concluding section follows.

Conceptual framework

Customer orientation

The customer orientation could be defined as a firm's ability to identify, understand and respond to its target buyers and continuously create superior value for them (Narver and Slater, 1990; Gatignon and Xuereb, 1997). It has been historically conceptualized around two competing approaches. The first is cultural (Narver and Slater, 1990), and the second is behavioral (Kohli and Jaworski, 1990). The cultural approach refers to the customer orientation as "the organization culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for buyers and, thus, continuous superior performance for the business" (Narver and Slater, 1990, p. 21), whereas Kohli and Jaworski's (1990, p. 3) description of customer orientation centers on an organization-wide generation and dissemination of, and responsiveness to, market intelligence. The integrated framework of the cultural and behavioral approaches used in this article is empirically confirmed by Homburg and Pflesser (2000).

Relationship between customer orientation and firm's business performance

It is widely acknowledged that a firm's success depends on a customer-oriented business culture (Deshpandé *et al.*, 1993; Gatignon and Xuereb, 1997). Through its commitment toward delivering superior customer value, a customer-oriented business should be able to achieve and sustain competitive advantage in any environmental situation (Slater and Narver, 1994) and create sustainably superior value for their customers (Narver and Slater, 1990). The empirical literature suggests that, in general, customer orientation can improve business performance (Pekovic and Rolland, 2012; Zhu and Nakata, 2007; Auh and Menguc, 2007; Yilmaz *et al.*, 2005; Cross *et al.*, 2007; Singh and Ranchhod, 2004; Brady and Cronin, 2001; Appiah-Adu and Singh, 1998). The main findings on the link between customer orientation and business performance are summarized in Table I.

Environmental customer innovation

Environmental innovations combine an environmental benefit with benefits not only for the firm but also for other market actors (Kemp and Arundel, 1998; Rennings and Zwick, 2002). The considerations of these actors on the market are especially important for environmental innovations (Cleff and Rennings, 1999), as firms may experience reduced customer demand if their environmental performance is doubtful (Klassen and McLaughlin, 1996). Moreover, 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 (Dobers and Wolff, 2000; Foster and Green, 2002).

The marketing literature is more often considered as an integral part of providing solutions to environmental problems (Leonidou and Leonidou, 2011). In the same vein, Kotler (2011) argues that environmental issues are likely to have a significant influence on marketing. The marketing literature also stresses that innovation activities are needed to satisfy the requests of "green" actors (Mariadoss *et al.*, 2011; Cronin *et al.*, 2011; Hall and Vredenburg, 2003). Therefore, integrating environmental issues into the

Table I.
The relationship
between customer
orientation and
business
performance

Studies	Sample composition	Business performance measures	Finding
Rolland and Pekovic (2012)	7,500 firms in a variety of industries in France	Logarithm of profit per employee and logarithm of EBITDA per employee	Positive
Auh and Menguc (2007)	980 largest firms operating in a variety of industries in Australia	Return-on-investment (ROI) Return-on-sales (ROS) Profit growth Sales growth Market share growth	Positive effect when a decentralized organization was coupled with formalization
Zhu and Nakata (2007)	189 US-based strategic business units	Marketing performance (market share, sales level, customer retention, product quality and new products) and financial performance (gross profit margin, ROI)	Positive (only indirect effect on financial performance)
Yilmaz <i>et al.</i> (2005)	134 manufacturing firms located in Turkey	Financial and market performance (sales growth, market share, ROS, ROA, profitability) and qualitative performance (quality improvements, new product development capability, employee satisfaction, employee commitment)	Positive
Brady and Cronin (2001)	649 US respondents from services industry (auto lube, amusement and video rental)	Overall service quality and behavioral outcomes (repurchase, customer loyalty and word of mouth)	Positive
Appiah-Adu and Singh (1998)	UK sample of 101 small- and medium-sized enterprises (SMEs)	New product success Sales growth ROI	Positive

marketing process has become essential for a firm's survival (Chan *et al.*, 2012). Mitchell *et al.* (2010) state that by investing in sustainable market orientation, firms can move beyond a conventional concentration defined by market orientation, which is significant for their competitive advantage. Moreover, the eco-marketing literature suggests that green products or services that include both public and environmental benefits for the customer generate strong consumer demand (Ottman, 1998). These customer benefits can take the form of cost and energy savings with more efficient appliances; improved product quality and durability; better repair, upgrade and disposal possibilities; and reduced health impacts (Kammerer, 2009). Thus, firms that wish to remain competitive in the market are expected to focus on environmental innovations with potential for customer benefits (Kammerer, 2009).

Relationship between environmental customer innovation and business performance

Environmental innovations may lead to "win-win" situations characterized by both economic and environmental benefits (Carraro, 2000; Horbach, 2008). Porter and Van

Der Linde (1995) provide several theoretical rationales explaining how environmental constraints encourage firms to use resources more efficiently, resulting in productivity improvements. Additionally, addressing “green” consumers’ concerns through environmentally friendly products enables firms to attract new customers, improve customer loyalty and increase overall demand for their products (Shrivastava, 1995), ultimately making these firms more competitive.

Empirically, the issue of whether environmental innovations are related to business performance reveals rather positive findings (Rennings and Rammer, 2011, 2009; Rennings *et al.*, 2006; Chen *et al.*, 2006). Previous studies have also found a positive link between environmental practices and business performance (Grolleau *et al.*, 2012 for comprehensive reviews).

Hypotheses development

Environmental customer innovation as a mediating mechanism. The rationale for choosing environmental innovation as a potential mediator in the relationship between customer orientation and business performance is based on the findings of Mariadoss *et al.* (2011), who argue that marketing capability influences the development and success of innovation-based sustainable environmental strategies, which boost a firm’s competitive advantage. Similarly, a firm can achieve competitive advantage through market-based sustainability if it strategically aligns itself with the market-oriented product needs and wants of customers and the interests of multiple stakeholders concerned about social responsibility issues with economic, environmental and social dimensions (Hult, 2011). In addition, marketing-related activities allow a business to achieve sustainability through innovative management (Closs *et al.*, 2011).

Despite the theoretical reasoning, the mediating role of environmental customer innovation in the relationship between customer orientation and business performance has not yet been tested in empirical analyses. However, empirical studies by Huhtala *et al.* (2014), Deshpandé *et al.* (1993) and Han *et al.* (1998) found innovation to be relevant to the relationship between customer orientation and business performance. This reasoning leads us to propose that a relevant mediating process by which customer orientation influences a firm’s business performance is through investment in environmental customer innovation.

We therefore explore the following hypothesis:

H1. Environmental customer innovation mediates the relationship between customer orientation and a firm’s business performance.

Contextual moderation effects

We further build on the mediation model above by introducing a contingency approach to a moderated mediation model. Scholars have identified the contingency approach as a valuable way to expand our understanding of the relationship between customer orientation, environmental innovation and firm’s business performance (Delmas and Pekovic, 2015; Grolleau *et al.*, 2014; Kumar *et al.*, 2011, 1998; Martin-Tapia *et al.*, 2008; Homburg *et al.*, 2007; Aragón-Correa and Sharma, 2003; Harris, 2001; Appiah-Adu, 1998; Greenley, 1995; Russo and Fouts, 1997; Slater and Narver, 1994). The discussion above suggests that a moderated mediation model will more comprehensively depict the relationship between customer orientation and firm performance. Specifically, this approach is useful, as previous research has shown that the effects of customer

orientation and environmental innovation are significantly affected by contextual factors such as market environment (market growth, competitive intensity and market uncertainty), size and sector of activity. Therefore, it is important to further examine the complexity of these relationships. In particular, in this paper, we examine how the aforementioned factors moderate the relationship between customer orientation, environmental customer orientation and business performance. In the following sections, we present our arguments for why the proposed contextual factors should influence both customer orientation and environmental customer innovation and, ultimately, business performance.

Market environment

The contingency view is confirmed in the market orientation literature, which indicates that firms should adjust their market orientation strategies according to changes in the market environment (Pekovic and Rolland, 2012; Kumar *et al.*, 2011, 1998; Homburg *et al.*, 2007; Harris, 2001; Appiah-Adu, 1998; Greenley, 1995; Slater and Narver, 1994).

Market growth. Previous studies on market orientation suggest that the benefits in terms of improving a firm's business performance are reinforced in markets experiencing strong growth, as they have little information about customers at their disposal, meaning that strong customer orientation is necessary to understand new customers (Pekovic and Rolland, 2012; Gatignon and Xuereb, 1997). Therefore, we expect the positive effect of customer orientation on business performance to be amplified in growing markets. Previous research provides a significant body of evidence confirming that market environment shapes the relationship between environmental management practices and business performance (Delmas and Pekovic, 2015; Grolleau *et al.*, 2014; Martin-Tapia *et al.*, 2008; López-Gamero *et al.*, 2009; Aragón-Correa and Sharma, 2003; Russo and Fouts, 1997). For instance, it has been argued that in growing markets, firms will generate better business performance when they adopt environmental management practices (Grolleau *et al.*, 2014; Aragón-Correa and Sharma, 2003; Russo and Fouts, 1997).

Therefore, we propose the following hypotheses:

- H2a.* Market growth positively moderates the relationship between customer orientation and firm's business performance.
- H2b.* Market growth positively moderates the mediating role of environmental customer innovation in the relationship between customer orientation and a firm's business performance.

Market competitiveness. Pekovic and Rolland (2012) provide evidence that customer orientation is an essential tool for improving business performance in highly competitive markets, as customers have growing needs, and it is important to ensure that they do not select competing alternatives (Kohli and Jaworski, 1990). Grolleau *et al.* (2014) also found that a highly competitive market is "unfavorable" for the adoption of environmental management practices, as environmental management practices negatively influence firm business performance.

Consequently we propose:

- H3a.* Market competitiveness positively moderates the relationship between customer orientation and firm's business performance.

H3b. Market competitiveness positively moderates the mediating role of environmental customer innovation in the relationship between customer orientation and firm's business performance.

Market uncertainty. Concerning the moderating effect of market uncertainty, [Kumar et al. \(1998\)](#) found that the greater the market uncertainty, the greater the positive impact of market orientation on performance. The analysis by [Martin-Tapia et al. \(2008\)](#) suggests that when perceived uncertainty levels are high, the relationship between environmental management practices and business performance is not significant.

Therefore, we hypothesize:

H4a. Market uncertainty positively moderates the relationship between customer orientation and firm's business performance.

H4b. Market uncertainty positively moderates the mediating role of environmental customer innovation in the relationship between customer orientation and firm's business performance.

Firm characteristics

Size. [Liu \(1995\)](#) found that medium-sized firms invest less in market-oriented practices than large firms. What is more, even though customer orientation is more important for success in small firms because it provides a source of differentiation and because of the interaction between managers and customers ([Brockman et al., 2012](#)), small firms also lack the resources to create a competitive advantage through customer orientation, which puts larger firms in a more advantageous position when considering firm performance improvement.

Generally, scholars consider firm size to be an important driver of environmental innovation adoption ([Brunnermeier and Cohen, 2003](#); [Grolleau et al., 2007](#); [Delmas and Pekovic, 2012](#)). While larger firms have the capacity and resources to invest in green activities, small firms find such investments harder to make ([Grolleau et al., 2007](#)). Consequently, larger firms are more advanced and efficient at implementing green and social activities ([Campbell, 2007](#); [Hillary, 2000](#)) than smaller firms, which puts larger firms in a better position to profit from the adoption of environmental practices.

We thus expect the following:

H5a. The relationship between customer orientation and a firm's business performance is stronger in large firms than in small firms.

H5b. The mediating effect of environmental customer innovation on the relationship between customer orientation and a firm's business performance is stronger in larger firms than in small firms.

Sector of activity. Given that there is greater dependence on person-to-person interactions in the services sector ([Singh, 2000](#); [McNaughton et al., 2002](#)), it appears that the relationship between customer orientation and firm performance is stronger in service firms than in manufacturing firms ([Cano et al., 2004](#); [Gray and Hooley, 2002](#)).

It is argued that the relationship between environmental practices and firm performance is not homogeneous across sectors because it could be influenced by industry-specific stakeholders such as employees, customers, communities and legal and regulatory bodies ([Brammer and Pavelin, 2006](#)). However, researchers agree that

environmental management practices are useful in both the manufacturing and services sectors as a means of improving customer loyalty and employee satisfaction, reducing costs and enhancing competitiveness (Enz and Siguaw, 1999; Goodman, 2000; Schendler, 2001).

Taken together, these points suggest the following:

H6a. The relationship between customer orientation and a firm's business performance is stronger in service firms than in manufacturing firms.

H6b. The mediating effect of environmental customer innovation on the relationship between customer orientation and a firm's business performance is stronger in service firms than in manufacturing firms.

Empirical analysis

Data

In this section, we describe the databases used to test the above hypotheses. Specifically, this research is based on three cross-sectional French surveys: the Organizational Changes and Computerization survey (COI, 2006), the Community Innovation Survey (CIS8, 2006-2008) and the Annual Firm Survey (EAE, 2003).

The Organizational Changes and Computerization[1] survey is a matched employer/employee survey on organizational change and computerization conducted between November 2005 and April 2006 by researchers and statisticians from the National Institute for Statistics and Economic Studies, the Ministry of Labor and the Center for Labor Studies. The Community Innovation Survey[2] was conducted by the French Institute for Statistics and Economic Studies over the period 2006-2008 and was based on the Oslo Manual drawn up by the OECD. The Annual Firm Survey[3] is an annual, exhaustive and compulsory survey conducted by the French Institute for Statistics and Economic Studies.

We merge data from these three sources to obtain a cross-sectional data set consisting of 3,720 firms with 20 or more employees. This merged data set includes firm characteristics, firm practices and technological and organizational changes in various industries. The COI survey contains information used for the construction of a customer orientation measure, whereas the CIS8 survey provides the information used to create an environmental customer innovation indicator. The EAE data set is used to integrate firm exportation into our model because this information is not available from the other two surveys.

Measures

Dependent and independent variables

Customer orientation. The customer orientation indicator is based on the integration of the two main existing approaches (Homburg *et al.*, 2007): the behavioral (cognitive) approach (Kohli and Jaworski, 1990) and the cultural (affective) approach (Narver and Slater, 1990).

Specifically, the following six items from the COI survey are used as components to construct the behavioral approach to customer orientation:

- (1) the firm has used tools to study client expectations, behavior or satisfaction;
- (2) the firm has used integrated IT management of customer relations (CRM);
- (3) the firm has used group work tools;

- (4) the firm has an internal department focused on improving customer relations management;
- (5) the firm has an internal external department focused on improving customer relations management; and
- (6) the firm has central databases for sales or distribution.

Additionally, the customer orientation of the affective organizational system follows [Becker and Homburg \(1999\)](#), whereby “management systems are designed to promote a business organization’s orientation toward its customers”. Following [Homburg *et al.* \(2007\)](#), we include five specific items related to customer responsiveness from the COI survey:

- (1) the firm is ISO 9000-certified;
- (2) the firm has used labeling tools for goods and services;
- (3) the firm has been engaged in the delivery or supply of goods or services to a fixed deadline;
- (4) the firm has been engaged in responding to claims or supplying aftersales services to a fixed deadline; and
- (5) the firm has a contact or call center for clients.

Each item of the customer orientation indicator is a binary variable equaling 1 if a firm possesses or has used the aforementioned items.

Environmental customer innovation. We use the CIS to create an indicator for environmental customer innovation, which includes the following components: the firm implemented procedures to regularly identify and reduce environmental impacts (e.g. preparing environmental audits, setting environmental performance goals, and ISO 14,001 certification) before or after 2006; the firm introduced products (goods or a service) or process, organizational or marketing innovation in response to current or expected customer requests for environmental innovations between 2006 and 2008 such as reduced energy use and reduced air, water, soil or noise pollution; and the firm improved recycling of a product after use in response to customers’ requests. The environmental customer innovation indicator consists of four scale items taking a value of 1 if a firm has invested in the aforementioned environmental customer innovation practices. Hence, environmental innovation is measured using comprehensive and detailed components that are entirely related to customer benefits that may be obtained from environmental innovation. Because of the lack of more differentiated data, the literature on environmental innovations neglects to analyze different areas of eco-innovation related to customer benefits ([Kammerer, 2009](#)). The empirical literature uses a more general indicator of environmental innovation that is presented as a binary yes/no scale ([Kammerer, 2009](#)). Therefore, we develop a more specific and novel indicator of environmental innovation.

Business performance. Given that enhanced customer satisfaction generates among others financial benefits and sales improvement ([Bhote, 1996](#); [Galbreath, 2002](#)), we use the variable *SALES*. Prior studies have used this measure ([Grolleau *et al.*, 2012](#); [Kumar *et al.*, 2011](#); [Avlonitis and Gounaris, 1997](#); [Huselid, 1995](#)), and it is obtained through the logarithm of the firm’s sales. [Huselid \(1995\)](#) indicated two main advantages of this measure. First, it offers a single index that can be used to compare sales between firms. Second, it makes it possible to calculate the direct value of returns on investments in

customer orientation and environmental customer orientation. It should be noted that sales is considered as a leading performance measure, as it has a strong influence on a firm's financial performance (Panagopoulos and Avlonitis, 2010; Capon *et al.*, 1990). The information on firm sales in 2008 is taken from the CIS survey.

Market growth. We use the variable *MARKET GROWTH*, which indicates how the firm's market or main activity evolved between 2003 and 2006, whether contracting, steady or growing.

Competition. The variable *COMPETITION* takes a value from 1 (not very strongly affected by new competitors in the market since 2003) to 4 (very strongly affected).

Uncertainty. We include the variable *UNCERTAINTY* which takes a value from 1 (not very strongly affected by uncertainty in the market since 2003) to 4 (very strongly affected).

Size. We introduce firm size in our model, as measured by a continuous variable representing the logarithm of the number of employees in the firm.

Sector of activity. We include sectoral dummy variables based on the N36 sector classification created by the French National Institute for Statistics and Economic Studies. We specifically introduce 11 dummy variables that equal 1 if a firm's activity is agri-food, consumable goods, cars and equipment, intermediate goods, energy, construction, sales, transport, financial and real estate activities, services for firms or services for individuals. Furthermore, we distinguish between the manufacturing and service sectors.

Reliability. The reliability of the customer orientation scale and the environmental customer innovation scale is tested using Cronbach's alpha coefficient. Cronbach's alpha is 0.70 for the customer orientation scale and 0.85 for environmental customer orientation, which can be considered satisfactory (Churchill, 1979).

Controls

As suggested by Gatignon and Xuereb (1997), the influence of customer orientation in determining the success of innovation and on firm business performance may vary depending on the market environment and firm strategies. Therefore, we include control variables shown to be important determinants of customer orientation, environmental customer innovation and business performance (Narver and Slater, 1990; Grinstein, 2008; Grolleau *et al.*, 2007; Delmas and Pekovic, 2012; Appiah-Adu, 1998; Harris, 2001).

Holding. Pekovic and Rolland (2012) find that being part of a holding company will increase the probability that a firm will invest in customer orientation. In the same vein, firms that belong to a holding company are better informed and bear less risk in adopting new practices (Pekovic, 2010; Delmas and Pekovic, 2012), such as environmental customer innovation, which in turn may reduce the costs of searching for the necessary environmental and customer information. Moreover, belonging to a holding company is thought to enhance a firm's business performance (Delmas and Pekovic, 2012; Pekovic and Rolland, 2012). Therefore, we include a dummy variable that has a value of 1 if the firm belonged to a holding company in 2003.

Financial restructuring. Previous researchers have confirmed the positive relationship between financial restructuring and customer orientation (Campbell, 2003; Pekovic and Rolland, 2012). However, financial restructuring negatively influences various types of innovation (Stiebale and Reize, 2011). Hence, we expect financial restructuring to negatively influence environmental customer innovation. Prior literature suggests a negative relationship between financial restructuring and firm sales (Capron and Hulland, 1999). Following above arguments, our empirical model

controls for a binary variable that equals 1 if a firm has faced financial restructuring since 2003 (e.g. merger, acquisition, transfer or buyback).

Export. Previous studies have shown that a firm's export orientation increases the probability that it will implement customer orientation practices (Rose and Shoham, 2002). From a signaling perspective, firms that are located far from their 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; Grolleau *et al.*, 2007; del Río González, 2009; Delmas and Pekovic, 2012). A firm's export activities can increase sales as exports increase the size of its market (Pekovic and Rolland, 2012). The effects of exports on customer orientation, environmental customer innovation and sales are measured by five variables. The first, denoted *EXPORT*, presents the logarithm of the firm's exports per employee in 2003 and takes the form of a continuous variable. Furthermore, to distinguish between different export destinations, we use the variables *LOCAL*, *REGIONAL*, *EU* and *INTERNATIONAL*, which equal 1 if a firm exported to a local, regional, European or international market, respectively, in 2003.

The variables used in the estimation, their definitions and sample statistics are presented in Table II. No problem of multicollinearity is detected (Appendix).

Empirical model

Notably, the same observable factors (e.g. size, sector of activity, market characteristics) can impact customer orientation, environmental customer innovation and firm sales, which may cause a spurious relationship to appear. Thus, using an ordinary least squares (OLS) regression is significantly problematic because it considers customer orientation and environmental customer innovation to be exogenous. To account for their endogeneity, we use a three-stage least squares (3SLS) model that considers customer orientation and environmental customer innovation to be endogenous variables. This model relies on a simultaneous estimation approach in which:

- the factors that determine customer orientation are estimated simultaneously with;
- the factors that explain environmental customer innovation with customer orientation. Concurrently, the model estimates; and
- the factors that define firm sales simultaneously with customer orientation and environmental customer innovation.

More precisely, the first step of a three-stage procedure predicts the values of each endogenous variable on all the exogenous regressors (identically as in the two-stage procedure). In the second step, the model uses the predicted values for customer orientation and environmental customer innovation found in the first step on the right-hand side of equations (1) and (2) applies the OLS. The residuals are then used to obtain an estimate of the covariance matrix of the error terms of the three equations. In the third step, the estimate of the cross-equation correlation matrix is used as a weighting matrix to calculate the generalized least squares estimator. The last two steps are iterated over the estimated disturbance covariance and parameter estimates until the parameter estimates converge.

The three equations are jointly estimated for each explanatory variable using maximum likelihood.

EJM 50,12	Variable	Mean	SD	Minimum	Maximum
2174	<i>Dependent variables</i>				
	Customer Orientation	6.09	2.57	0.00	11.00
	Environmental Customer Innovation	1.83	1.87	0.00	5.00
	Sales	11.98	1.71	4.67	17.48
	<i>Independent variables</i>				
	Automated data search	0.39	0.49	0.00	1.00
	Data analysis	0.64	0.48	0.00	1.00
	Internal environmental department	0.56	0.50	0.00	1.00
	External environmental department	0.63	0.48	0.00	1.00
	Size	6.67	1.41	2.77	11.57
	Holding	0.82	0.38	0.00	1.00
	Financial restructuring	0.36	0.48	0.00	1.00
	Relocation	0.11	0.31	0.00	1.00
	Export	1.85	2.46	0.00	7.83
	National	0.83	0.37	0.00	1.00
	Regional	0.79	0.41	0.00	1.00
	EU	0.57	0.49	0.00	1.00
	International	0.48	0.50	0.00	1.00
	Market growth	2.07	0.71	0.00	3.00
	Competition	2.34	0.82	0.00	4.00
Uncertainty	2.75	0.81	0.00	4.00	
Sector of activity ^a					

Table II.

Sample statistics of variables used

Note: ^aBecause of the Table's length we do not report sample statistics for variables representing sector of activity

Y_1^* , Y_2^* and Y_3^* are latent variables influencing the probability that the firm will invest in customer orientation, will invest in environmental customer innovation and improve its sales, respectively. This gives us the following 3SLS model:

$$\begin{cases} Y_1^* = \alpha_1 + \beta_1 X_1 + \delta_1 Z_1 + \mu_1 \\ Y_2^* = \alpha_2 + \beta_2 X_2 + \gamma_1 Y_1 + \delta_2 Z_2 + \mu_2 \\ Y_3^* = \alpha_3 + \beta_3 X_3 + \gamma_1 Y_1 + \gamma_2 Y_2 + \mu_3 \end{cases} \quad (1)$$

Similarly, when testing the moderated mediation model, YM_1^* , YM_2^* and Y_3^* are latent variables that, respectively, influence the probability that the firm will invest in customer orientation, will invest in environmental customer innovation under different contextual factors and improve business performance:

$$\begin{cases} YM_1^* = \alpha_1 + \beta_1 X_1 + \delta_1 Z_1 + \mu_1 \\ YM_2^* = \alpha_2 + \beta_2 X_2 + \gamma_1 YM_1 + \delta_2 Z_2 + \mu_2 \\ Y_3^* = \alpha_3 + \beta_3 X_3 + \gamma_1 YM_1 + \gamma_2 YM_2 + \mu_3 \end{cases} \quad (2)$$

In both models X_1 , X_2 and X_3 are the vectors of exogenous variables including firm characteristics such as size, being part of a holding company, restructuring, export, export destination, market growth, competition, market uncertainty and sector activity.

As suggested by [Ozer-Balli and Sorensen \(2012\)](#), in the moderated mediation model, we use demeaned interaction terms. More precisely, we mean-centered variables used for the formation of interaction terms to reduce potential multicollinearity concerns ([Aiken and West, 1991](#)).

The variable Z_i (in both models) represents the vector of instrumental variables that guarantee the identification of the model and facilitate the estimation of correlation coefficients ([Maddala, 1983](#)). A 3SLS model circumvents the problem of interdependence by using instrument variables to obtain the predicted values of the endogenous variables (in our case, customer orientation). Hence, to identify the 3SLS model, we need additional variables that explain the probability that a firm will invest in customer orientation but are not correlated with the error term of the sales equation. Following [Pekovic and Rolland \(2012\)](#), Z_1 indicates that the firm used automated data search tools in 2003 (e.g. electronic document management system – EDM – or knowledge management tools) and that the firm had data analysis tools in 2003, e.g. statistical analysis and decision-making tools. As explained by the authors, data collection and analysis inform firms about customers. Moreover, scholars indicate that one of the main drivers of customer performance improvement is the particular knowledge management tool used ([Gebert et al., 2003](#)). [Homburg et al. \(2007\)](#) further indicate that data collection and analysis are important elements of customer orientation.

As in the previous case, the variable Z_2 represents the vector of instrumental variables that explain the probability that a firm will invest in environmental customer innovation, but is not correlated with the error term of the sales equation. For environmental customer innovation, the vector Z_2 is designed to measure whether a firm had a full-time environmental, safety or compatibility manager or an outsourced manager for environmental safety or compatibility in 2003. The choice of these variables may be based on the fact that an administrative unit (such as the environmental, safety or compatibility unit) indicates closer proximity to institutionalized practices, thus increasing the perceived need to comply with these practices ([Beck and Walgenbach, 2005](#); [Pekovic, 2010](#)). For instance, [Pekovic \(2010\)](#) finds that having internal or external quality departments makes implementing the ISO 9000 standard more likely. Additionally, administrative departments (in our case, environmental safety or compatibility departments) serve as direct channels through which new practices enter the firm from its institutional environment ([Dobbin et al., 1988](#); [Pekovic, 2010](#)).

$\beta_1 - \beta_9$, $\gamma_1 - \gamma_9$, $\delta_1 - \delta_9$ are slope coefficients to be estimated. Finally, $\alpha_1 - \alpha_9$, $\mu_1 - \mu_9$ are the intercepts and disturbance terms for the three equations, respectively.

[Greenley \(1995\)](#) pointed to a lagged effect between market orientation and firm performance. Similarly, [Dawes \(2000\)](#) argued that a firm can enhance its market orientation, but the rewards in terms of profitability might take some time to be reaped. In other words, it could be that the positive effect of market orientation on firm performance is reflected a few years after the investment is made. Therefore, we use lagged information about customer orientation over a five-year period. Additionally, to address reverse-causality issues, because high sales may allow firms to invest in customer orientation and environmental customer innovation, we model lagged effects, where the relationship between investment in customer innovation in 2003 and firm sales in 2008 is mediated by investment in environmental customer innovation between 2006 and 2008.

Results and discussion

We first present the estimation results regarding the factors that may influence firms to invest in customer orientation (Table III, Column 1). The variables *SIZE*, *HOLDING*, *FINANCIAL RESTRUCTURING*, *EXPORT*, *REGIONAL*, *EU*, *GROWTH*, *COMPETITION* and *UNCERTAINTY* are significant, as expected. One sector, energy, is more sensitive to investment in customer orientation. Finally, both instrumental variables are positive and significant.

The estimated results indicate that investment in customer orientation improves environmental customer innovation because the coefficient of customer orientation on environmental customer innovation is positive and significant ($p < 0.001$) (Table III, Column 2). This finding confirms a large body of literature that supports the argument that higher investment in market or customer orientation leads to better innovation (Kim

Variables	(1) Customer orientation	(2) Environmental customer innovation	(3) Sales
Customer orientation		0.25*** (0.05)	0.10*** (0.03)
Environmental customer innovation			0.41*** (0.09)
Automated data search	0.78*** (0.07)		
Data analysis	0.93*** (0.07)		
Internal environmental department		-0.01 (0.06)	
External environmental department		0.25*** (0.07)	
Size	0.72*** (0.02)	0.18*** (0.04)	0.71*** (0.02)
Holding	0.28*** (0.09)	0.04 (0.08)	0.06 (0.04)
Financial restructuring	0.27*** (0.07)	0.03 (0.06)	-0.04 (0.03)
Export	0.12*** (0.02)	0.11*** (0.02)	0.10*** (0.01)
National	-0.08 (0.09)	-0.04 (0.07)	0.17*** (0.04)
Regional	0.21*** (0.09)	-0.17** (0.08)	0.16*** (0.04)
EU	0.31*** (0.10)	-0.32*** (0.08)	-0.13*** (0.05)
International	-0.11 (0.10)	0.58*** (0.08)	-0.12 (0.07)
Growth	0.38*** (0.05)	0.02 (0.04)	0.04** (0.02)
Competition	0.15*** (0.04)	-0.12*** (0.03)	-0.02 (0.02)
Uncertainty	0.27*** (0.04)	-0.10*** (0.04)	0.03 (0.02)
Agri-food	0.01 (0.13)	-0.77*** (0.11)	0.86*** (0.09)
Consumption goods	-0.46*** (0.15)	-0.60***	0.39*** (0.08)
Cars and equipment	0.06 (0.11)	-0.19*** (0.09)	0.00 (0.05)
Energy	1.24*** (0.28)	0.13 (0.23)	0.87*** (0.12)
Construction	-0.13 (0.16)	0.67*** (0.13)	0.28*** (0.10)
Sales	-0.29*** (0.12)	-0.76*** (0.10)	1.24*** (0.09)
Transport	-0.30** (0.15)	-0.48*** (0.12)	0.19*** (0.08)
Financial and real-estate activities	-0.09 (0.25)	-0.19 (0.20)	0.82*** (0.11)
Services for firms	-0.48*** (0.13)	-0.44*** (0.11)	-0.09 (0.07)
Services for individuals	-1.09*** (0.20)	-0.50*** (0.17)	-0.06 (0.10)
Constant	-2.14*** (0.27)	-0.40* (0.24)	5.05*** (0.13)
<i>F</i> -statistics	117.60	65.49	545.88
Observations	3,720	3,720	3,720

Table III.
3SLS estimates of the
effect of customer
orientation,
environmental
customer innovation
and sales

Notes: Standardized coefficient; standard errors in parentheses; *, ** and *** indicate parameter significance at the 10, 5 and 1% levels, respectively

et al., 2011; Grinstein, 2008; Lukas and Ferrell, 2000). Furthermore, as we indicate, our model proposes findings concerning the determinants of environmental customer innovation. As expected, we found that *SIZE*, *EXPORT* and *INTERNATIONAL* positively influence a firm's investment in environmental customer innovation, whereas *REGIONAL*, *EU*, *COMPETITION* and *UNCERTAINTY* have a negative influence. Moreover, as in Grolleau *et al.* (2012), we find no relationship between environmental customer innovation and market growth. The variables relating to holding company status, financial restructuring and national export destination have no statistical influence on the adoption of environmental customer innovation. Concerning the sector of activity, we conclude that being a part of the construction sector increases the probability that a firm will invest in environmental customer innovation. Finally, at least one of our instrumental variables is significant. More precisely, having an external environmental department increases the likelihood that a firm will invest in environmental customer innovation.

Our analyses show that customer orientation positively impacts a firm's sales, lending support to previous studies that show the relevance to a firm's success of investing in customer orientation (Pekovic and Rolland, 2012; Zhu and Nakata, 2007; Yilmaz *et al.*, 2005; Singh and Ranchhod, 2004; Cross *et al.*, 2007) (Table III, Column 3). Additionally, the mediating role of environmental customer innovation in the relationship between customer orientation and sales is supported, confirming *H1* (Table III, Column 3). Therefore, the mediated model proposes an indirect mechanism, such as environmental customer innovation, that explains the link between customer orientation and sales and serves to enhance the information provided by the direct effect model.

Consistent with the prior literature, the variables *SIZE*, *EXPORT*, *NATIONAL*, *REGIONAL* and *GROWTH* are positive and significant concerning sales, whereas *EU* and *INTERNATIONAL* have negative effects (Table III, Column 3). Finally, when considering sector of activity, the findings indicate that operating on the following sectors increases a firm's chances of improving sales: agri-food, consumable goods, energy, construction, sales, transport, finance and real estate and services for individuals.

The results from Table IV indicate that customer orientation through environmental customer innovation is positively and significantly associated with firm sales in growth markets ($\gamma_4 = 0.75$, $p < 0.001$), thereby lending support for both *H2a* and *H2b*. Accordingly, the results support the role of customer orientation as a driver of environmental customer innovation. These findings also add to a growing body of literature that confirms the importance of customer orientation for business performance in a growth market (Pekovic and Rolland, 2012; Gatignon and Xuereb, 1997). Therefore, market growth is necessary to understand the mediating role of environmental customer innovation, thereby emphasizing the attraction of the moderated mediation model.

The results indicate that customer orientation is positively and significantly associated with firm sales in highly competitive markets ($\gamma_5 = 0.40$, $p < 0.001$) which supports *H3a* (the results are available from the authors upon request)[4]. Therefore, the results are in accordance with previous literature which asserts that firms operating in highly competitive markets are likely to enjoy higher performance if they manage customer requirements and needs effectively (Pekovic and Rolland, 2012). However, *H3b* is not supported by our findings, as variables representing customer orientation

Variables	(1) Customer orientation × market growth	(2) Environmental customer innovation × market growth	(3) Sales
Customer orientation × market growth		0.22*** (0.09)	0.75*** (0.07)
Environmental customer innovation × market growth			0.34*** (0.12)
Automated data search	0.14*** (0.02)		
Data analysis	0.10*** (0.02)		
Internal environmental department		-0.07*** (0.02)	
External environmental department		0.13*** (0.02)	
Size	-0.00 (0.02)	0.02 (0.01)	0.93*** (0.02)
Holding	-0.24*** (0.08)	0.08 (0.06)	0.30*** (0.07)
Financial restructuring	-0.14*** (0.06)	0.06 (0.05)	0.13*** (0.05)
Export	-0.06*** (0.02)	0.02* (0.01)	0.21*** (0.01)
National	0.16* (0.08)	0.05 (0.06)	-0.02 (0.07)
Regional	0.09 (0.08)	-0.24*** (0.06)	0.15** (0.07)
EU	0.14 (0.09)	0.05 (0.06)	-0.33*** (0.07)
International	0.11 (0.08)	-0.24*** (0.06)	0.09 (0.08)
Growth	-	-	-
Competition	0.06* (0.04)	-0.00 (0.03)	-0.10*** (0.03)
Uncertainty	-0.10*** (0.04)	-0.03 (0.03)	0.14*** (0.03)
Agri-food	-0.05 (0.11)	0.06 (0.08)	0.55*** (0.10)
Consumption goods	0.62*** (0.13)	-0.34*** (0.11)	-0.36*** (0.12)
Cars and equipment	0.04 (0.10)	-0.21*** (0.07)	-0.03 (0.09)
Energy	-0.86*** (0.23)	-0.58*** (0.19)	2.07*** (0.22)
Construction	-0.08 (0.14)	-0.16 (0.10)	0.64*** (0.12)
Sales	-0.00 (0.10)	-0.23*** (0.07)	0.95*** (0.09)
Transport	-0.13 (0.12)	-0.31*** (0.09)	0.14 (0.11)
Financial and real-estate activities	-0.78*** (0.21)	-0.48*** (0.17)	1.57** (0.19)
Services for firms	-0.03 (0.11)	-0.14* (0.08)	-0.31*** (0.09)
Services for individuals	-0.26 (0.17)	-0.13 (0.12)	-0.21 (0.14)
Constant	0.15 (0.21)	0.23 (0.15)	4.54*** (0.18)
<i>F</i> -statistics	8.99	6.02	207.40
Observations	3,720	3,720	3,720

Table IV.
3SLS estimates of the effect of customer orientation, environmental customer innovation and sales in growth market

Notes: Standardized coefficient; standard errors in parentheses; *, ** and *** indicate parameter significance at the 10, 5 and 1% levels, respectively

have no significant effect on environmental customer innovation. Therefore, the mediating role of environmental customer innovation is not confirmed.

Furthermore, the obtained evidences indicate that customer orientation has a positive influence (through environmental customer innovation) on business performance in highly uncertain markets ($\gamma_6 = 0.88, p < 0.001$) (the results are available from the authors upon request). Additionally, as customer orientation has positive influence on environmental customer innovation, we may conclude that both *H4a* and *H4b* are supported. The results are consistent with those obtained by Kumar *et al.* (1998), indicating that market uncertainty positively shapes the relationship between market

orientation and business performance. The findings support moderated mediation effects when analyzing the influence of customer orientation on firm performance.

Comparing the obtained coefficient, it can be noted that the effect when looking at market growth is higher than that obtained from market competition but lower than that obtained from uncertainty. Interestingly, the coefficients obtained from the moderated mediation model are higher than those obtained only from the mediating model, implying that the effect of customer orientation on firm performance is amplified in growth, highly competitive and uncertain markets. Consistent with previous studies (Grolleau *et al.*, 2014), environmental customer innovation improves business performance when the market is growing, whereas when the market is competitive or uncertain, this relationship either disappears or becomes negative.

H5 is not supported by our results. The moderated mediation effect of customer orientation in larger firms is positive but not significant (the results are available from the authors upon request), while it is positive and significant when looking at the sample of small firms. Notwithstanding, the effect of customer orientation on environmental customer innovation is negative and barely significant, indicating that investment in customer orientation practices directly improves firm's performance in small firms. Furthermore, the results suggest that larger firms make more effective use of practices related to environmental customer innovation, as their effect is positive and significant comparing to small firm where this effect is negative.

Finally, *H6* is not confirmed by our findings. The results show that the effect of customer orientation on sales is positive and significant for the manufacturing sectors but not for services sectors (the results are available from the authors upon request). The results imply that customer orientation is a valuable asset for manufacturing firms.

Overall, these findings provide support for the moderated mediation model in which environmental customer orientation mediates the relationship between customer orientation and firm's business performance in different contexts.

Conclusion

The purpose of this study is to develop a better theoretical and empirical understanding of the causal mechanisms and contextual factors explaining the relationship between customer orientation and business performance. It seeks to build on the previous literature by untangling the relationships between customer orientation, environmental customer innovation, internal and external environment and firm performance. While scholars have previously examined the direct relationship between customer orientation and business performance, as well as the mediating role of innovation and moderating role of contextual factors in this relationship, we empirically tested all relationships within one moderated mediation model and provide the marketing literature with an insightful perspective. This research identifies a path through which customer orientation can be related to improved business.

We presume that the direct effect of customer orientation on firm performance may be because of the existence of intermediate mechanisms such as innovation-based strategies for environmental sustainability that are affected by customer orientation and in turn influence firm performance. Accordingly, we confirm that Hult's "market orientation plus" concept, which is related to market-focused sustainability including market orientation efforts that incorporate additional stakeholders and triple bottom line (economic, environmental and social dimensions) issues (Hult, 2011), is essential for

firm performance. Moreover, by using a moderated mediation approach, we found that the mediating effect of environmental customer innovation on the link between customer orientation and business performance under different contextual factors can be significantly stronger or weaker. Consequently, the extent to which environmental customer innovation mediates the relationship between customer orientation and business performance is contingent upon the internal and external factors. Our results specifically demonstrate that the mediated effect of customer orientation on firm performance can be improved if certain boundary conditions are in place. Therefore, understanding the mediating role of environmental customer innovation and the moderating roles of contextual factors is shown to be important in explaining the relationship between customer orientation and business performance. The moderated mediation model therefore allows us to evaluate different aspects of the relationship between customer orientation and business performance, which is not the case when mediation and moderation are tested independently.

This study makes an important contribution by opening up this “black box” and offers a more detailed perspective on how and why customer orientation affects firm performance. In particular, we demonstrate the relevance of innovation-based strategies for environmental sustainability (environmental customer orientation) as a mediating mechanism between customer orientation and business performance. This result can be interpreted as an indication that investment in customer orientation indirectly influences firm performance through environmental customer innovation, which can therefore be said to be one of the mechanisms providing greater insight into the processes through which customer orientation impacts a firm’s sales. Moreover, we hope to advance the understanding of the relationship between customer orientation and business performance by examining complex moderated mediation hypotheses. The analysis identified conditions where compatibilities between internal and external factors with customer orientation are beneficial for firm performance. To improve business performance by investing in customer orientation, firms need to align this investment with internal and external conditions. The results imply that if the moderated mediation model is not taken into consideration, the analysis relating customer orientation to a firm’s business performance will be biased. In this sense, we provide explanation as to why some firms are able to effectively adopt customer orientation, and thus improve their performance. This analysis offers a fine-grained perspective by identifying the mechanism and restraint conditions that make customer orientation beneficial for firm performance. We believe that these results contribute to the literature on customer orientation, sustainable innovation and business performance in several ways.

First, support for the hypothesized mediating role of environmental customer innovation lends credence to the argument put forward by Peters (1984), which states that superior corporate performance is derived from a total commitment to customer satisfaction, which can be brought about by continuous innovation. The results of this study concerning the effect of customer orientation on a firm’s business performance through environmental customer innovation confirm this belief. Our findings further support that marketing capabilities can be a catalyst for innovation-based strategies for environmental sustainability (Mariadoss *et al.*, 2011).

Second, our study is among the first to propose and empirically test an integrated moderated mediation model of the relationship between customer orientation and business performance. We show that the mediating effect of customer orientation on

business performance through environmental customer innovation depends on contextual factors. Specifically, we provide evidence that the magnitude of the effect of customer orientation through the mediator, environmental customer innovation, varies depending on contextual factors. Our findings suggest that growing and uncertain markets create suitable conditions in which firms should invest in customer orientation to improve performance. Regarding internal contextual factors, it could be concluded that manufacturing firms can benefit more by investing in customer orientation. Accordingly, the proposed moderated mediation model more comprehensively depicts the relationship between customer orientation and business performance by illustrating the complexity that characterizes the effects of customer orientation on business performance. Considering the moderated mediation model, the present study identifies the conditions under which customer orientation through environmental customer innovation is related to improved performance. However, a lack of fit with internal and external environments could result in decreased performance.

Third, by controlling for detailed firm characteristics and features, we go beyond many studies in the field of customer orientation, environmental innovation and firm performance. This research extends and contributes to the environmental innovation literature by adopting a specific definition for an environmental customer innovation indicator. Finally, this study is one of the first to examine the indirect mechanisms that explain the importance of customer orientation for firm outcomes in the French context, where the limited empirical research has mainly focused on direct effects among these variables (Deshpandé *et al.*, 1996).

Managerial implications

Our study has implications for managers. The results of the mediating model show that firms with higher levels of customer orientation display greater potential for achieving a higher degree of innovation-based strategies for environmental sustainability, both of which result in better business performance. According to our results, to achieve market success and sustain a competitive advantage, managers must simultaneously invest in customer orientation (Deshpandé *et al.*, 1993) and sustainable innovations (Mariadoss *et al.*, 2011; Gunday *et al.*, 2011). Furthermore, managers are encouraged to evaluate and improve, if necessary, the design of sustainable innovation strategies that are related to customer benefits.

Managers should also be aware that customer orientation through environmental customer innovation provides greater benefits in terms of improving business performance, but whether firms can exploit this potential will depend on contextual factors. More precisely, managers should consider market environment, firm size and sector of activity as important contingencies in their decision whether to invest in customer orientation. Therefore, they should be aware that the relationship between customer orientation and firm performance is not straightforward. Decisions about investment in customer orientation should not be taken without first examining the internal and external environments. For instance, the findings of this study suggest that investing in customer orientation when the market is growing is an effective way to enhance business performance, while for manufacturing firms, the investment in customer orientation will also significantly pay off compared to service firms. The findings imply that it is not enough to invest in customer orientation, as its effect is dependent on the internal and external environments. Furthermore, managers should know that a “one-size-fits-all” approach to environmental customer innovation adoption is not adequate.

Our findings encourage managers to view customer orientation investment as a complex strategy and thus avoid biased analysis of the effects of customer orientation. The results indicate that managers need to be aware that internal and external contextual factors are essential in establishing an environment in which investment in customer orientation can translate into improved firm performance. They must first understand internal and external factors, and then supplement this by investing in customer orientation. In other words, managers have to adjust their investment in line with their internal and external environments to achieve better performance. They need to adopt a holistic view of customer orientation that includes moderated mediation aspects.

Limitations and directions for future research

This study has certain limitations that should be the subject of further research. First, because our data concentrate on the French institutional framework, it is unclear to what extent our findings can be generalized to other national contexts. Hence, future research may consider analyzing the same issue but taking into account different international settings. Second, this article focuses on a single mediator mechanism. Examining other relevant mechanisms would help advance our understanding of the link between customer orientation and firm performance. Third, interesting extensions to this research would include investigating additional dimensions of business performance such as profit, added value and export, and assessing whether the positive relationships are sustainable. The choice of performance measures matters because they mediate the relationships between a firm's investment in customer orientation and the effects on environmental customer innovation and firm performance (Pekovic and Rolland, 2012). Fourth, the majority of variables used are binary, which could lead to a biased picture of the actual situation. Fifth, as environmental issues not only concern consumers but also all other market actors, it would be highly useful to verify the obtained results using broader concepts such as Hult's (2011) "market orientation plus" concept or the "sustainable market orientation" developed by Mitchell *et al.* (2010). Sixth, some refinements could be made in the scales used to measure market growth to investigate the non-linear effects of this variable. Finally, each survey was conducted in a particular situation and in a particular context, which can have an influence on results.

Notes

1. Changement Organisationnel et Informatisation. More details about the design and scope of this survey are available at: www.enquetecoi.net: Survey COI-TIC 2006-INSEE-CEE/Treatments CEE.
2. Enquête Communautaire sur l'innovation. More details about the design and scope of this survey are available at: www.insee.fr/fr/methodes/default.asp?page=sources/sou-enq-communaut-innovation-cis.htm
3. Enquête Annuelle Entreprises. More details about the design and scope of this survey are available at: www.insee.fr/fr/methodes/default.asp?page=definitions/enquete-annuelle-entreprises.htm
4. Since our two proposed instrumental variables for environmental customer innovation were not significant in the models relating to market competition and uncertainty, to better identify our model we include additional instrumental variable named *RELOCATION* which indicates whether the firm has relocated an office or plant abroad since 2003. A justification

for introducing this variable could be found in previous literature indicating that achieving scale economies by applying the same environmental practices across all production units and not needing to relocate in pollution havens can drive firms to adopt environmental practices (Grolleau and Mzoughi, 2005).

References

- Aiken, L.S. and West, S.G. (1991), *Multiple Regression: Testing and Interpreting Interactions*, Sage, Newbury Park, CA.
- Ang, S.H., Leong, S.M. and Kotler, P. (2000), "The Asian apocalypse: crisis marketing for consumers and businesses", *Long Range Planning*, Vol. 33, pp. 97-119.
- Appiah-Adu, K. (1998), "Market orientation and performance: empirical tests in a transition economy", *Journal of Strategic Marketing*, Vol. 6 No. 1, pp. 24-45.
- Appiah-Adu, K. and Singh, S. (1998), "Customer orientation and performance: a study of SMEs", *Management Decision*, Vol. 36 No. 6, pp. 385-394.
- Aragón-Correa, J.A. and Sharma, S. (2003), "A contingent resource-based view of proactive corporate environmental strategy", *Academy Management Review*, Vol. 28 No. 1, pp. 71-88.
- Auh, S. and Menguc, B. (2007), "Performance implications of the direct and moderating effects of centralization and formalization on customer orientation", *Industrial Marketing Management*, Vol. 36 No. 11, pp. 1022-1034.
- Avlonitis, G.J. and Gounaris, S.P. (1997), "Marketing orientation and company performance: industrial versus consumer goods companies", *Industrial Marketing Management*, Vol. 26, pp. 385-402.
- Beck, N. and Walgenbach, P. (2005), "Technical efficiency or adaptation to institutionalized expectations? The adoption of ISO 9000 standards in the German mechanical engineering industry", *Organization Studies*, Vol. 26 No. 6, pp. 841-866.
- Becker, J. and Homburg, C. (1999), "Market-oriented management: a systems-based perspective", *Journal of Market Focused Management*, Vol. 4 No. 1, pp. 17-41.
- Bhote, K. (1996), *Beyond Customer Satisfaction to Loyalty*, American Management Association, New York, NY.
- Brady, M.K. and Cronin, J.J. (2001), "Customer orientation: effects on customer service perceptions and outcome behaviors", *Journal of Service Research*, Vol. 3 No. 3, pp. 241-251.
- Brammer, S. and Pavelin, S. (2006), "Corporate reputation and social performance: the importance of fit", *Journal of Management Studies*, Vol. 43, pp. 435-455.
- Brockman, B.K., Jones, M.A. and Becherer, R.C. (2012), "Customer orientation and performance in small firms: examining the moderating influence of risk-taking, innovativeness, and opportunity focus", *Journal of Small Business Management*, Vol. 50, pp. 429-446.
- Brunnermeier, S.B. and Cohen, M.A. (2003), "Determinants of environmental innovation in US manufacturing industries", *Journal of Environmental Economics and Management*, Vol. 45, pp. 278-293.
- Campbell, A.J. (2003), "Creating customer knowledge competence: managing customer relationship management programs strategically", *Industrial Marketing Management*, Vol. 32 No. 5, pp. 375-383.
- Campbell, J.L. (2007), "Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility", *Academy of Management Review*, Vol. 32, pp. 946-967.

- Cano, C.R., Carrillat, F.A. and Jaramillo, F. (2004), "A meta-analysis of the relationship between market orientation and business performance: evidence from five continents", *International Journal of Research in Marketing*, Vol. 21 No. 2, pp. 179-200.
- Capon, N., Farly, J.U. and Hoenig, S.M. (1990), "A meta-analysis of financial performance", *Management Science*, Vol. 16, pp. 1143-1159.
- Capron, L. and Hulland, J. (1999), "Redeployment of brands, sales forces, and marketing expertise following horizontal acquisitions: a resource-based view", *Journal of Marketing*, Vol. 63 No. 2, pp. 41-54.
- Carraro, C. (2000), "Environmental technological innovation and diffusion: model analysis", in Hemmelskamp, J., Leone, F. and Rennings, K. (Eds), *Innovation-Oriented Environmental Regulation: Theoretical Approaches and Empirical Analysis*, Physica Verlag Heidelberg, New York, NY, pp. 269-297.
- Chan, H.K., He, H. and Wang, W.Y.C. (2012), "Green marketing and its impact on supply chain management in industrial markets", *Industrial Marketing Management*, Vol. 41 No. 4, pp. 557-562.
- Chen, Y.-S., Lai, S.-B. and Wen, C.-T. (2006), "The influence of green innovation performance on corporate advantage in Taiwan", *Journal of Business Ethics*, Vol. 67 No. 4, pp. 331-339.
- Churchill, G.A. (1979), "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research*, Vol. 16 No. 1, pp. 64-73.
- Cleff, T. and Rennings, K. (1999), "Determinants of environmental product and process innovation – evidence from the Mannheim innovation panel and a follow-up telephone survey", *European Environment*, Vol. 9 No. 5, pp. 191-201.
- Closs, D., Speier, C. and Meacham, N. (2011), "Sustainability to support end-to-end value chains: the role of supply chain management", *Journal of the Academy of Marketing Science*, Vol. 39 No. 1, pp. 101-116.
- Cronin, J.J., Smith, S.J. Jr, Gleim, R.M., Ramirez, E. and Martinez, D.J. (2011), "Green marketing strategies: an examination of stakeholders and the opportunities they present", *Journal of the Academy of Marketing Science*, Vol. 39, pp. 158-174.
- Cross, M.E., Brashear, T.G., Rigdon, E.E. and Bellenger, D.N. (2007), "Customer orientation and salesperson performance", *European Journal of Marketing*, Vol. 41 Nos 7/8, pp. 821-835.
- Dawes, J. (2000), "Market orientation and company profitability: further evidence incorporating longitudinal data", *Australian Journal of Management*, Vol. 25 No. 2, pp. 173-199.
- De Marchi, V. (2012), "Environmental innovation and R&D cooperation: empirical evidence from Spanish manufacturing firms", *Research Policy*, Vol. 41 No. 3, pp. 614-623.
- del Río González, P. (2009), "The empirical analysis of the determinants for environmental technological change: a research agenda", *Ecological Economics*, Vol. 68 No. 3, pp. 861-878.
- Delmas, M. and Pekovic, S. (2012), "Environmental standards and labor productivity: understanding the mechanisms that sustain sustainability", *Journal of Organizational Behavior*, Vol. 34 No. 2, pp. 230-252.
- Delmas, M. and Pekovic, S. (2015), "Resource efficiency strategies and market conditions", *Long Range Planning*, Vol. 48 No. 1, pp. 80-94.
- Deshpandé, R., Farley, J.U. and Webster, F.E. (1993), "Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis", *Journal of Marketing*, Vol. 57 No. 1, pp. 23-37.
- Deshpandé, R., Farley, J.U. and Webster, F.E. (1996), "Factors affecting organizational performance: a five country comparison", Report 97-108, Marketing Science Institute, Cambridge, MA.

- Dobbin, F.R., Edelman, L.B., Meyer, J.W., Scott, W.R. and Swidler, A. (1988), "The expansion of due process in organizations in institutional patterns and organizations", in Zucker, L.G. (Ed.), *Institutional Patterns in Organizations: Culture and Environment*, Ballinger, Cambridge, MA, pp. 71-98.
- Dobers, F. and Wolff, R. (2000), "Competing with 'soft' issues – from managing the environment to sustainable business strategies", *Business Strategy and the Environment*, Vol. 9 No. 3, pp. 143-150.
- Enz, C.A. and Siguaw, J.A. (1999), "Best hotel environmental practices", *Cornell Hotel and Restaurant Administration Quarterly*, Vol. 40, pp. 72-77.
- Flatters, P. and Willmott, M. (2009), "Understanding the post-recession consumer", *Harvard Business Review*, Vol. 7 Nos 7/8, pp. 106-112.
- Foster, C. and Green, K. (2002), "Environmental innovation in industry: the importance of environment-tally-driven users", *International Journal of Environmental Technology and Management*, Vol. 2 No. 4, pp. 303-314.
- Galbreath, J. (2002), "Twenty-first century management rules: the management of relationships as intangible assets", *Management Decision*, Vol. 40 No. 2, pp. 116-126.
- Gatignon, H. and Xuereb, J.M. (1997), "Strategic orientation of the firm and new product performance", *Journal of Marketing Research*, Vol. 34, pp. 77-90.
- Gebert, H., Geib, M., Kolbe, L.M. and Brenner, W. (2003), "Knowledge-enabled customer relationship management", *Journal of Knowledge Management*, Vol. 7 No. 5, pp. 107-123.
- Goodman, A. (2000), "Implementing sustainability in service operations in Scandic hotels", *Interfaces*, Vol. 30, pp. 202-214.
- Gray, B.J. and Hooley, G.J. (2002), "Market orientation and service firm performance – a research agenda", *European Journal of Marketing*, Vol. 36, pp. 980-989.
- Greenley, G. (1995), "Market orientation and company performance: empirical evidence from UK companies", *British Journal of Management*, Vol. 6, pp. 1-13.
- Grinstein, A. (2008), "The relationships between market orientation and alternative strategic orientations", *European Journal of Marketing*, Vol. 42 Nos 1/2, pp. 115-134.
- Grolleau, G. and Mzoughi, N. (2005), "Overcomplying for profit: a note", *Environmental Economics and Policy Studies*, Vol. 6 No. 4, pp. 267-269.
- Grolleau, G., Mzoughi, N. and Pekovic, S. (2007), "Chemical firms' registration for the responsible care program and the ISO 14001 standard: a comparative approach", *Economic Bulletin*, Vol. 12 No. 29, pp. 1-13.
- Grolleau, G., Mzoughi, N. and Pekovic, S. (2012), "Is business performance related to the adoption of quality and environmental-related standards?", *Environmental and Resource Economics*, Vol. 54 No. 4, pp. 525-548.
- Grolleau, G., Mzoughi, N. and Pekovic, S. (2014), "Environmental management practices: good or bad news for innovations delivering environmental benefits? The moderating effect of market characteristics", *Economic of Innovation and New Technology*, Vol. 24 No. 4, pp. 339-359.
- Gunday, G., Ulusoy, G., Kilic, K. and Alpkan, L. (2011), "Effects of innovation types on firm performance", *International Journal of Production Economics*, Vol. 133, pp. 662-676.
- Hall, J. and Vredenburg, H. (2003), "The challenges of innovating for sustainable development", *Sloan Management Review*, Vol. 45 No. 1, pp. 61-68.
- Han, J.K., Kim, N. and Shrivastava, R.K. (1998), "Market orientation and organizational performance: is innovation a missing link?", *Journal of Marketing*, Vol. 62, pp. 30-45.

- Harris, L.C. (2001), "Market orientation and performance: objective and subjective empirical evidence from UK companies", *Journal of Management Studies*, Vol. 38 No. 1, pp. 17-43.
- Hillary, R. (2000), *Small and Medium-Sized Enterprises and the Environment. Business Imperatives*, Greenleaf Publishing, Sheffield.
- Homburg, C. and Pflessner, C. (2000), "A multiple-layer model of market-oriented organizational culture: measurement issues and performance outcomes", *Journal of Marketing Research*, Vol. 37 No. 11, pp. 449-462.
- Homburg, C., Grozdanovic, M. and Klarmann, M. (2007), "Responsiveness to customers and competitors: the role of affective and cognitive organizational systems", *Journal of Marketing*, Vol. 71 No. 3, pp. 18-38.
- Horbach, J. (2008), "Determinants of environmental innovation – new evidence from German panel data sources", *Research Policy*, Vol. 37, pp. 163-173.
- Horbach, J. and Rennings, K. (2013), "Environmental innovation and employment dynamics in different technology fields – an analysis based on the German Community Innovation Survey 2009", *Journal of Cleaner Production*, Vol. 57, pp. 158-165.
- Horbach, J., Rammer, C. and Rennings, K. (2012), "Determinants of eco-innovations by type of environmental impact – the role of regulatory push/pull, technology push and market pull", *Ecological Economics*, Vol. 78, pp. 112-122.
- Hughes, P., Morgan, R.E. and Kouropalatis, Y. (2008), "Market knowledge diffusion and business performance", *European Journal of Marketing*, Vol. 42 Nos 11/12, pp. 1372-1395.
- Huhtala, J.-P., Sihvonen, A., Frösén, J., Jaakkola, M. and Tikkanen, H. (2014), "Market orientation, innovation capability and business performance", *Baltic Journal of Management*, Vol. 9 No. 2, pp. 134-152.
- Hult, G.T. (2011), "Market-focused sustainability: market orientation plus!", *Journal of the Academy of Marketing Science*, Vol. 39 No. 1, pp. 1-6.
- Huselid, M.A. (1995), "The impact of human resource management practices on turnover, productivity, and corporate financial performance", *Academy of Management Journal*, Vol. 38, pp. 635-672.
- Kammerer, D. (2009), "The effects of customer benefit and regulation on environmental product innovation. Empirical evidence from appliance manufacturers in Germany", *Ecological Economics*, Vol. 68, pp. 2285-2295.
- Kemp, R. and Arundel, A. (1998), "Survey indicators for environmental innovation", *IDEA Report*, STEP Group, Oslo.
- Kim, D., Basu, C., Naidu, G.M. and Cavusgil, E. (2011), "The innovativeness of born-global and customer orientation: learning from Indian born-global", *Journal of Business Research*, Vol. 64 No. 8, pp. 879-886.
- Klassen, R.D. and McLaughlin, C.P. (1996), "The impact of environmental management on firm performance", *Management Science*, Vol. 42 No. 8, pp. 1199-1214.
- Kohli, A.K. and Jaworski, B.J. (1990), "Market orientation: the construct, research propositions, and managerial implications", *Journal of Marketing*, Vol. 54, pp. 1-18.
- Kotler, P. (2011), "Reinventing marketing to manage the environmental imperative", *Journal of Marketing*, Vol. 75 No. 4, pp. 132-135.
- Kumar, K., Subramanian, R. and Yauger, C. (1998), "Examining the market orientation – performance relationship: a context specific study", *Journal of Management*, Vol. 24, pp. 201-233.

- Kumar, V., Jones, E., Venkatesan, R. and Leone, R.P. (2011), "Is market orientation a source of sustainable competitive advantage or simply the cost of competing?", *Journal of Marketing*, Vol. 75 No. 1, pp. 16-30.
- Leonidou, C.S. and Leonidou, L.C. (2011), "Research into environmental marketing/management: a bibliographic analysis", *European Journal of Marketing*, Vol. 45 Nos 1/2, pp. 68-103.
- Liu, H. (1995), "Market orientation and firm size: an empirical examination in UK firms", *European Journal of Marketing*, Vol. 29, pp. 57-71.
- López-Gamero, M., Molina-Azorín, J. and Claver-Cortés, E. (2009), "The whole relationship between environmental variables and firm performance: competitive advantage and firm resources as mediator variables", *Journal of Environmental Management*, Vol. 90 No. 10, pp. 3110-3121.
- Lukas, B. and Ferrell, O. (2000), "The effect of market orientation on product innovation", *Journal of the Academy of Marketing Science*, Vol. 28 No. 2, pp. 239-247.
- Lusch, R.F. and Webster, F.E. Jr (2010), "Marketing's responsibility for the value of the enterprise", Working Paper Series 2010, Report No. 10-111, Marketing Science Institute, Cambridge, MA.
- McNaughton, R.B., Osborne, P. and Imrie, B.C. (2002), "Market-oriented value creation in service firms", *European Journal of Marketing*, Vol. 36, pp. 990-1002.
- Maddala, G.S. (1983), *Limited-Dependent and Qualitative Variables in Econometrics*, Cambridge University Press, New York, NY.
- Mariadoss, B.J., Tansuhaj, P.S. and Mouri, N. (2011), "Marketing capabilities and innovation-based strategies for environmental sustainability: an exploratory investigation of B2B firms", *Industrial Marketing Management*, Vol. 40 No. 8, pp. 1305-1318.
- Martin-Tapia, I., Aragón-Correa, J.A. and Senise-Barrio, M.E. (2008), "Being green and export intensity of SMEs: the moderating influence of perceived uncertainty", *Ecological Economics*, Vol. 68 Nos 1/2, pp. 56-67.
- Matsuo, M. (2006), "Customer orientation, conflict, and innovativeness in Japanese sales departments", *Journal of Business Research*, Vol. 59 No. 2, pp. 242-250.
- Mitchell, R.W., Wooliscroft, B. and Higham, J. (2010), "Sustainable market orientation: a new approach to managing marketing strategy", *Journal of Macromarketing*, Vol. 30 No. 2, pp. 160-170.
- Narver, J.C. and Slater, S.F. (1990), "The effect of a market orientation on business profitability", *Journal of Marketing*, Vol. 54 No. 4, pp. 20-35.
- Ottman, J.A. (1998), *Green Marketing: Opportunity for Innovation*, McGraw-Hill, New York, NY.
- Ozer-Balli, H. and Sorensen, B.E. (2012), "Interaction effects in econometrics", *Empirical Economics*, Vol. 45 No. 1, pp. 583-603.
- Panagopoulos, N.G. and Avlonitis, G.J. (2010), "Performance implications of sales strategy: the moderating effects of leadership and environment", *International Journal of Research in Marketing*, Vol. 27, pp. 46-57.
- Pekovic, S. (2010), "The determinants of ISO 9000 certification: a comparison of the manufacturing and service sectors", *Journal of Economic Issues*, Vol. 44 No. 4, pp. 895-914.
- Pekovic, S. and Rolland, S. (2012), "An empirical investigation of the effect of customer orientation on the business performance of French firms: a firm-level analysis of direct and moderation effects", *Recherche et Applications en Marketing*, Vol. 27 No. 4, pp. 11-37.
- Peters, T.J. (1984), "Strategy follows structure: developing distinctive skills", *California Management Review*, Vol. 26, pp. 111-125.

- Porter, M.E. and Van Der Linde, C. (1995), "Towards a new conception of the environment-competitiveness relationship", *Journal of Economic Perspectives*, Vol. 9 No. 4, pp. 97-118.
- Rennings, K. and Rammer, C. (2009), "Increasing energy and resource efficiency through innovation – an explorative analysis using innovation survey data", *Czech Journal of Economics and Finance*, Vol. 59, pp. 442-459.
- Rennings, K. and Rammer, C. (2011), "The impact of regulation-driven environmental innovation on innovation success and firm performance", *Industry and Innovation*, Vol. 18 No. 3, pp. 255-283.
- Rennings, K. and Zwick, T. (2002), "The employment impact of cleaner production on the firm level empirical evidence from a survey in five European countries", *International Journal of Innovation Management*, Vol. 6, pp. 319-342.
- Rennings, K., Ziegler, A., Ankele, K. and Hoffmann, E. (2006), "The influence of different characteristics of the EU environmental management and auditing scheme on technical environmental innovations and economic performance", *Ecological Economics*, Vol. 57 No. 1, pp. 45-59.
- Rose, G.M. and Shoham, A. (2002), "Export performance and marketing orientation: establishing an empirical link", *Journal of Business Research*, Vol. 55 No. 3, pp. 217-225.
- 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.
- Schendler, A. (2001), "Trouble in paradise: the rough road to sustainability in Aspen", *Corporate Environmental Strategy*, Vol. 8 No. 4, pp. 293-299.
- Shrivastava, P. (1995), "Environmental technologies and competitive environment", *Strategic Management Journal*, Vol. 16, pp. 183-200.
- Singh, J. (2000), "Performance productivity and quality of frontline employees in service organizations", *Journal of Marketing*, Vol. 64 No. 2, pp. 15-34.
- Singh, S. and Ranchhod, A. (2004), "Market orientation and customer satisfaction: evidence from British machine tool industry", *Industrial Marketing Management*, Vol. 33 No. 2, pp. 135-144.
- Slater, S.F. and Narver, J.C. (1994), "Does competitive environment moderate the market orientation performance relationship?", *Journal of Marketing*, Vol. 58, pp. 46-55.
- Stiebale, J. and Reize, F. (2011), "The impact of FDI through mergers and acquisitions on innovation in target firms", *International Journal of Industrial Organization*, Vol. 29 No. 2, pp. 155-167.
- Yilmaz, C., Sezen, B. and Ozdemir, O. (2005), "Cultural determinants of customer- and learning-oriented value systems and their joint effects on firm performance", *Journal of Business Research*, Vol. 58 No. 10, pp. 1340-1352.
- Zhu, Z. and Nakata, C. (2007), "Reexamining the link between customer orientation and business performance: the role of information systems", *Journal of Marketing Theory and Practice*, Vol. 15 No. 3, pp. 187-203.

Further reading

- Dibrell, C., Craig, J. and Hansen, E. (2011), "Natural environment, market orientation, and firm innovativeness: an organizational life cycle perspective", *Journal of Small Business Management*, Vol. 49 No. 3, pp. 467-489.

Appendix

Variables	Customer orientation	Environmental customer innovation	Sales	Automated data search	Data analysis	Internal environmental department	External environmental department	Size	Holding
Customer orientation	1.00	-	-	-	-	-	-	-	-
Environmental customer innovation	0.38	1.00	-	-	-	-	-	-	-
Sales	0.54	0.40	1.00	-	-	-	-	-	-
Automated data search	0.31	0.22	0.27	1.00	-	-	-	-	-
Data analysis	0.36	0.16	0.31	0.32	1.00	-	-	-	-
Internal environmental department	0.31	0.15	0.18	0.12	0.14	1.00	-	-	-
External environmental department	0.36	0.24	0.28	0.16	0.20	0.49	1.00	-	-
Size	0.50	0.35	0.82	0.20	0.24	0.09	0.26	1.00	-
Holding	0.21	0.15	0.23	0.10	0.12	0.01	0.16	0.21	1.00
Financial restructuring	0.11	0.06	0.09	-0.03	0.04	0.07	0.08	0.12	0.11
Relocation	0.17	0.17	0.10	0.01	0.07	0.07	0.10	0.08	0.09
Export	0.61	0.32	0.30	0.15	0.16	0.11	0.14	-0.04	0.15
Local	-0.09	-0.09	-0.04	-0.02	-0.04	0.01	0.02	0.10	-0.13
Regional	0.21	0.13	0.17	0.04	0.09	0.12	0.20	-0.04	0.15
EU	0.26	0.22	0.16	0.09	0.14	0.15	-0.04	0.12	0.13
International	0.27	0.31	0.23	0.14	0.13	0.18	-0.02	0.15	0.11
Growth	0.13	0.13	0.08	0.08	0.03	0.02	0.05	0.05	0.01
Competition	0.08	-0.03	0.02	-0.03	-0.01	0.02	0.05	0.00	0.05
Uncertainty	0.12	0.01	0.05	-0.02	0.03	0.06	0.04	0.01	0.01

(continued)

Note: Similar to those mentioned for Table I, we do not report results vconcerning the variable ACTIVITY

Table AI.

Variables	Financial restructuring	Relocation	Export	Local	Regional	EU	International	Growth	Competition	Uncertainty
Customer orientation	-	-	-	-	-	-	-	-	-	-
Environmental customer innovation	-	-	-	-	-	-	-	-	-	-
Sales	-	-	-	-	-	-	-	-	-	-
Automated data search	-	-	-	-	-	-	-	-	-	-
Data analysis	-	-	-	-	-	-	-	-	-	-
Internal environmental department	-	-	-	-	-	-	-	-	-	-
External environmental department	-	-	-	-	-	-	-	-	-	-
Size	-	-	-	-	-	-	-	-	-	-
Holding	-	-	-	-	-	-	-	-	-	-
Financial restructuring	1.00	-	-	-	-	-	-	-	-	-
Relocation	0.07	1.00	-	-	-	-	-	-	-	-
Export	-0.02	0.23	1.00	-	-	-	-	-	-	-
Local	0.03	-0.08	-0.23	1.00	-	-	-	-	-	-
Regional	0.11	0.17	0.37	-0.13	1.00	-	-	-	-	-
EU	0.04	0.24	0.60	-0.14	0.49	1.00	-	-	-	-
International	0.01	0.26	0.61	-0.17	0.40	0.71	1.00	-	-	-
Growth	-0.01	0.00	0.04	-0.05	0.00	0.03	0.09	1.00	-	-
Competition	0.05	0.10	0.18	-0.04	0.04	0.06	0.08	-0.03	1.00	-
Uncertainty	0.00	0.10	0.06	-0.06	0.15	0.18	0.15	-0.24	0.30	1.00

About the authors

Dr Sanja Pekovic has a PhD in Economics from the University Paris-EST. She is an Associate Professor at the University of Montenegro and Visiting Researcher at the University Paris-Dauphine. Her research interests are within the field of quality and environmental economics, economics of innovation and applied econometrics; on these topics she has presented studies at national and international scientific congresses, which have been published in international journals. Dr Pekovic was a visiting scholar at the INRA-SupArgo (Montpellier), at the University of Montenegro (Podgorica), at the Laboratoire CNRS UMI 2615 Franco-Russe PONCELET (Moscow), and at Institute of Environment, UCLA (Los Angeles). In 2013, she received the Research Impact on Practice Award, which recognizes sustainability research that has important implications for managers and other practitioners (organized by the Organizations and the Natural Environment (ONE) Division of the Academy of Management). Sanja Pekovic is the corresponding author and can be contacted at: psanja@ac.me

Dr Sylvie Rolland is a Professor of Marketing and Strategy at the University Paris-Dauphine. She obtained a doctorate degree in Management Science and Business Administration from the University of Paris-Dauphine, France. Dr Rolland holds a chair "Organizations & Performance" with the main objective to develop research program on sustainable development. Her research and teaching activities are mainly focused on customer relationship management. Prior to entering academia, for over 10 years, Dr Sylvie worked as a consultant in the field of marketing.

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgroupublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com