

# ORGANIZATIONAL IMPLICATIONS OF E-BUSINESS USE FOR EUROPEAN RETAILERS

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## ABSTRACT

*Most of the e-business research has focused on the antecedents and consequences on firm performance. However this paper analyzes the antecedents of the extent of e-business use and its effect on strategic, management and marketing changes. In order to achieve this goal, we have used data from 691 retailers of seven European countries. We have divided the sample in two groups depending on the level of e-commerce of the countries. Results suggest that IT expertise and the perceived benefits are the main factors that influence in the level of e-business use. Related to the consequences, the use of e-business implies changes in firm's strategy, management and marketing in all the countries, so firms should think over the implementation of the e-business due to its strong organizational implications.*

## Keywords:

Organizational implications, e-business use, European retailers, cross-country

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## 1. Introduction

The potential of electronic business (e-business) to transform business models, organizational structures and processes, and the relationships with customers, suppliers and other business partners is now universally acknowledged (Zhu, 2004; Zhu *et al.*, 2006). E-business describes an integration of communications technologies with business processes and management practices via Internet, including buying and selling, connecting key players to the business systems and allowing access to the information they need (Simpson and Doherty, 2004; Turban *et al.*, 2004). These Web technologies help firms to understand customer needs, to customize products, to adopt product-market solutions or to take customer's orders.

Considerable research has focused on analyzing the antecedents of e-business adoption and use (Teo and Pian, 2003; Lin and Lin, 2008), and its impact on performance (Arvanitis, 2005; Wu *et al.*, 2003). E-business is considered as a disruptive innovation that radically changes the traditional way of doing business (Lee, 2001). Companies have to be prepared to reorganise and restructure themselves continuously. However, the effective assimilation of e-business technologies requires their integration into existing organizational business processes. So, firms might need changes into the business (Keen and McDonald 2000; Chu and Smithson, 2007). Although these reorganization and changes are proposed by previous research (Jackson and Harris, 2003), there is scarce empirical evidence of the internal impact of e-business use and the challenges that this decision implies for the firm. (Yasin *et al.*, 2006). The few studies are theoretical, case studies or preliminary investigations.

The main purpose of this paper is to examine the organizational impact of conducting e-business. We want to examine in what extent changes in management, in the corporate strategy and in marketing are explained by conducting e-business. Because recent research suggests that the study of the antecedents and consequences of e-business should be made holistically, in a single context (Wu *et al.*, 2003; Mishra *et al.*, 2007), we examine the organizational implications of conducting e-business together with its antecedents as an integrative model. Our study focuses its attention on analyzing three aspects of restructuration: the strategy, the management of the firm and the marketing tactics.

There has been an emphasis on analyzing e-business among US firms, however in the last decade there has been a strong interest in analyzing the e-business antecedents and its impact in different countries. Nowadays, we find articles focused on Europe (Oliveira and Martins, 2010; Koellinger, 2008; Ho *et al.*, 2007). However, Hanafizadeh *et al* (2009) found that even in Europe there are strong differences. In this paper we propose a cross-country analysis differing between countries with a higher level of e-commerce diffusion among individuals and those with a lower level.

This paper contributes to increase the empirical evidence of the impact of e-business adoption in firm changes y using a sample of 696 European retailers. The analysis performed complements to the research in this area so far. In this way, new conclusions can be drawn regarding the decision of adopting e-business. By developing a better understanding of the changes that e-business adoption involves, managers should consider its adoption as a strategic decision and should take measures within the firm to maximize the effectiveness of the adoption.

This paper is organised as follows. First, we explain the organizational implications of conducting e-business. Then, we present the antecedents of its adoption to complete the integrated model. We will continue explaining the methodology used and next, we present the results. We finish with the discussion of the results, the limitations of the paper and future research.

## 2. Organizational implications of conducting e-business

Inter-organizational systems have an impact on the value chain management as well as on the relationships within the value chain (Chatfield and Andersen, 1997). According to Porter (2001), Internet and ICTs are engaged and may impact on all the activities of the value chain.

Internet technologies influence on the cost and quality of all the activities of the chain value: logistics, operations, marketing and sales, after sales services, human resources management, technology development and procurement. Every activity involves the creation, processing, and communication of information and Internet has the ability to link one activity with others and make data widely available, both within the company and with suppliers, channel partners and customers.

Different terminologies have been used to refer to e-business process, such as 'ICT-enabled organisational change' (Kling and Tillquist, 2000), 'ICT-enabled business transformation' (Venkatraman, 1994) and 'ICT-enabled Business Process Reengineering (BPR)' (Davenport, 1993). All these terms emphasize the internal implications of the adoption of ICTs. Companies have to be prepared to reorganise and restructure themselves continuously.

We propose different kinds of organizational implications for conducting e-business: changes in corporate strategy, in management and in marketing. We will explain each of them with more detail.

### ***Changes in corporate strategy***

In the process of responding to new challenges, the firm has to adjust and modify its corporate strategy. A firm should analyze its industry forces and value chain activities, its resources and its core competencies. Managers must rethink their business strategy beyond building a Web site (Lee 2001). For example, developing e-commerce is not only related to create a Webpage, but also a web-based business model (Ghosh, 1998). The use of e-commerce creates new marketplace. It has the power to influence not only markets, but also industry structures (Dans, 2004). Developing a strategy for the new marketplace is essential for the firm success (Chang *et al.*, 2003; Phan, 2003).

E-commerce and e-business reduces customer search, customer switching costs and access to new products in new channels (Bakos, 1997). A new business model has appeared with the use of Internet and e-technologies: the organization as a network. This new business model requires the implementation of a more flexible corporate scope. One of the most important factors the firm considers when implementing e-commerce and e-business is related to the modification of the existing business strategy (Yasin *et al.*, 2006).

Therefore, managers have to learn how to adapt their organizational and technological capabilities to be in line with the business vision (Venkatraman, 1994). Thus, we propose

### **H1: e-business could cause changes in corporate strategy**

### ***Changes in management***

Using or implementing e-business may also impact on the management of the firm. E-business is changing the basis of competition. The speed of reaction is changing, the marketplace is more dynamic and all the information is available not only for customers but also for competitors. While firm could compete in the traditional business at a local level, now, competition is wider. Competition in the new marketplace changes compared to a traditional point of view. Competitors are numerous as the marketplace has no barriers; new entrants have access to the market, which has low entry barriers

ICTs use implies changes in work practices and establishing new methods to link the company with customers, suppliers and/or internal stakeholders (Hammer and Champy, 1993). Firms support changes in the work process or the implementation of new forms of work organisation. Changes in production inputs, in job design, in work allocation and in the use of suppliers and subcontractors appear.

E-business has a significant impact on the management of inter-organisational processes (Croom, 2005). Thus, managers have to learn how to integrate e-technologies with their business processes and how to make people to share information (Buhman *et al.*, 2005). So, we propose that:

## **H2: e-business could cause changes in management**

### ***Changes in marketing***

In the last years, Internet Marketing has emerged as a new paradigm of marketing (Eid, 2005). New Internet-based marketing techniques have been developed, creating a new world for Marketing (Kalyanam and McIntyre, 2002). These new technologies have brought new marketing terms and tactics. The term e-marketing, refers to the use of the Internet and e-technologies to conduct marketing activities. Additional new terms are related to the marketing plan, referring now to the e-Marketing plan (Krishnamurty, 2006). There are more than 30 e-marketing tools and terms, such as viral marketing, usability, banner ads, pop over and pop under ads, e-coupons, chat rooms or user ratings and reviews, among others (Kalyanam and McIntyre, 2002). Additional to the general 4P's, in the e-Marketing mix, marketers should include elements such as site, personalization, security, privacy, community and customer support. Marketing programs should be adapted to the new situation. To include these elements in the Marketing decisions, marketers should take into account that now it is expected a deeper integration and coordination across elements than in the traditional marketing mix.

E-business may impact customer service. Relationships with customers are changing and firms could take advantages of e-business attributes and of some ICTs to build long-term relationships based on loyalty (Lee 2001). If the firm wants to optimize customer relationships it requires a complete understanding of its customers. The current trend nowadays is to organize business processes to treat customers individually (Renner, 2000). Marketers can benefit of creating and using network effects to build a customer base. Thus, we propose:

### **H3: e-business could cause changes in marketing.**

#### ***Control variables***

Changes in the strategy, in management and marketing can be also influenced by external aspects such as the environment. Competitive pressure may make firms adapt to the new situations and adapt their strategy. In this environment, it is required flexible and creative strategies (Grant, 2003). New external environments require new strategies (Markides, 1998). Slater and Narver (1994) also found that uncertainty influences the effectiveness of marketing strategies. In environments with greater competition and with unpredictable demand, a strategy based on market orientation is more important and marketing tactics may change to be more effective.

We also include size as control variable that may affect the decision of undertaking business changes. Research suggests that size influence on the probability to change (Kelly and Amburgey, 1991) and innovation (Hitt *et al.*, 1990). Larger companies are more reluctant to change their process and are less flexible. On the other hand, small firms are more flexible and active than large firms (Chen and Hambrick, 1995). Those firms may have a competitive advantage in volatile and uncertainty environments (Fiegenbaum and Karnani, 1991).

## **3. Antecedents of the level of e-business adoption**

Most of research in ICT has focused on analyzing the antecedents of e-business (Zhu *et al.*, 2003, Dubelaar *et al.*, 2005; Bayo-Moriones and Lera-Lopez, 2007; Lin and Lin, 2008). In this area of research has emerged a contextual framework about this concern called Technological, Organisational and Environmental Framework (TOE). This framework suggests that the drivers of e-business can be categorised in technological, organizational and environmental factors (Lin and Lin, 2008). In the organizational context we include IT expertise and size; in the technological context we include the expected benefits and in the environmental context we include the stakeholders' pressure and the competitive pressure. Next, we will explain with more detail each of these factors. Thus, we propose:

***IT expertise***

Human resources are critical factors for the diffusion and level of use of the technology (Chen *et al.*, 2003). The firm has to maintain qualified IT professionals and to increase the level of IT skills on workers (Bresnahan *et al.*, 2002). On the one hand, the level of IT knowledge among employees is a key factor that drives e-technologies' adoption (Mehrtens *et al.*, 2001). Firms that have e-business specialists are more likely to adopt IT innovations because they could develop their own website or use specific technologies for a better management of the value chain (Lin and Lee, 2005). On the other hand, firms that do not have IT expertise may not see the whole potential of new technologies or may not want to take the risk of adopting them. Cragg and Zinatelli (1995) identified the lack of technical expertise as a key factor inhibiting Information Systems (IS) evolution and sophistication. Thus, we propose:

**H4: IT expertise will influence positively on the level of e-business adoption**

***Firm size***

The use and rate of adoption of new web technologies depends on the level of firm size. There is a greater likelihood of adoption of an active website amongst larger retailers than among smaller retailers (Zhu *et al.*, 2003; Wu *et al.*, 2003). In UK, largest retailers are the ones that are at the forefront of e-commerce (Ellis-Chadwick *et al.*, 2002). This may be caused because larger retailers are more likely to have the required resources, skilled personnel and technical infrastructure to support e-commerce. On the other hand, other authors suggest that larger firms will not adopt these technologies because of their investment in established distribution relationships and they have lower flexibility (Auger and Gallaughier 1997; Ghosh, 1998). Thus, we propose:

**H5: size will influence positively on the level of e-business adoption**

***Perceived benefits***

The perceived benefits of the technology influence the adoption and use of new technologies (Kuan and Chau, 2001; Gibbs and Kraemer, 2004). In the literature, perceived benefits are related to the extent the new technology generates more benefits than the current technology. It is more likely that a firm adopts a technology if the expected benefits are higher than the benefits of maintaining the current one (Moore and Benbasat, 1991). Among the perceived benefits are costs savings or income generation, opportunities in new markets, new distribution channel or higher visibility (Poon and Swatman, 1999)

The advantages of adopting e-business are mainly the increase of sales, (Barua *et al.*, 2004) and the reduction of costs (Garicano and Kaplan, 2004). Additionally to these advantages, the e-business enables companies to expand internationally and reduce the transaction costs (Currie 2004). Other benefits are in terms of quality, customer services or product development (Bresnahan *et al.*, 2002). Thus, we propose:

**H6: Perceived benefits will influence positively on the level of e-business adoption.**

***Pressure stakeholders***

Researches have found that external pressure from customers or suppliers are relevant in the study of e-business adoption (Prekumar and Ramamuthry; 1995; Chau and Tam, 1997; Del Aguila and Padilla, 2008; Wang and Ahmed, 2009). Suppliers and clients may make a big pressure because the benefits and advantages of these technologies are maximized as much people use them (network effects) (Iacovou *et al.*, 1995). Furthermore, if suppliers and/or clients have already adopted those technologies, the firm will be pressured to adjust and adapt its business processes and management if it wants to continue the relationship with them. Otherwise, the firm will take the risk of being market isolated (Chwelos *et al.*, 2001; Kuan and Chau, 2001). Thus, we propose:

**H7: pressure of customers and suppliers will influence positively in the level of e-business adoption.**

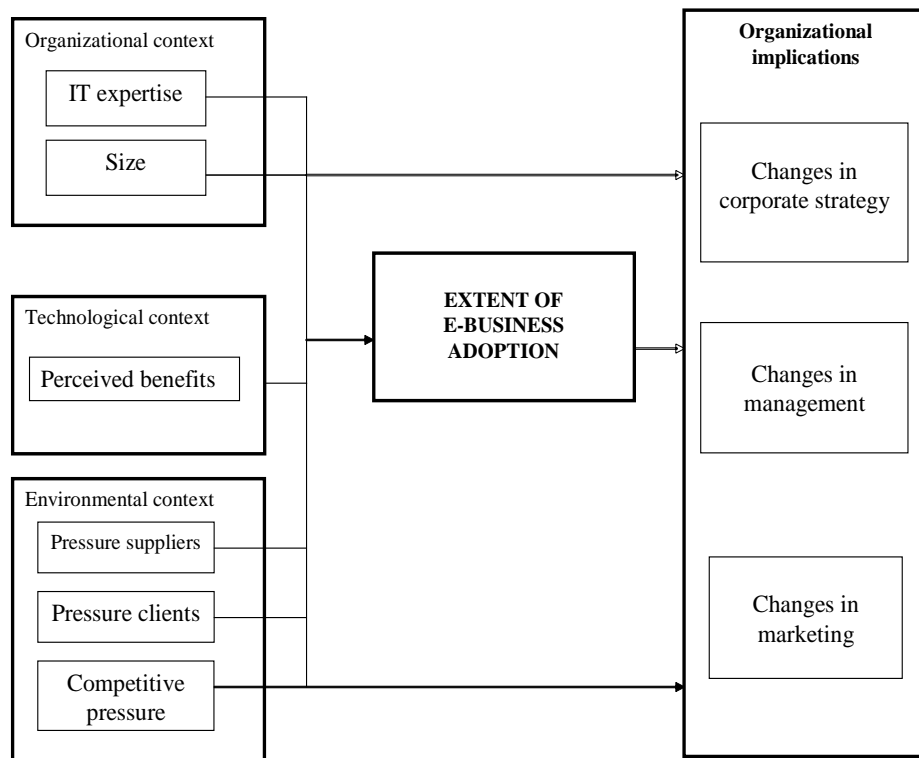
### Competitive pressure

In those environments where the rivalry is increasing with unpredictable actions by competitors, products and technology change rapidly, the use of the new technologies has even more importance (Pavlou and El Sawy, 2010). Environmental uncertainty has been overlooked in e-technologies adoption research (Larsen, 2003). Firms with environmental pressures for adopting e-business improve their performance outcomes (Coltman *et al.*, 2007). Intense rivalry prompts firms to keep a watch on competitors' decisions (Gattignon and Robertson, 1989). In markets with strong competition, firms tend to obtain updated information to enhance their decisions (Karimi *et al.*, 2004) and ICT innovations are seen, nowadays, as a requisite to compete (Premkumar and Ramamurthy, 1995). So, we expected that:

**H8: Competitive pressure will influence positively in the use of e-business.**

The figure 1 reflects the conceptual model.

FIGURE 1  
Conceptual model



## 4. Methodology

The dataset used for this study originated from the August/October 2007 enterprise survey of the "e-Business W@tch" ([www.ebusiness-watch.org](http://www.ebusiness-watch.org)). The key objective of the e-Business W@tch was to gather information about the use of ICTs and their application for electronic business in companies in order to derive indicators in the industrial sector. The survey was carried out in different European countries (France, Sweden, UK, Netherlands, Spain, Italy and Poland) and was addressed to retailing firms. It contains 691 surveys. The e-Business data was collected through CATI interviews, usually with an IT manager or a senior professional in the IT department. In the case of larger companies there are dedicated positions for e-business management, while in micro and small enterprises the respondent is someone at the level of managing director or owner.

### Variables

Our dependent variables are **organizational implications in different areas of the firm**. Firms were asked: *“During the last year, has your company introduced major changes in its corporate strategy?. In its management techniques? In its marketing concepts?”*. Answers were yes or no, so we have created a dummy variable that takes value 1 if the firm has made changes and 0 otherwise.

The other dependent variable is the **level of e-business adoption**. In particular, firms were asked the following question about the intensity of use of e-business: *“Would you say that most of your business processes are conducted as e-business, a good deal of them, some or none?”*. The categorical values were then used to generate a binary variable “conducting e-business” that takes value 1 if the firm conducts a good deal or most of the processes as e-business and 0 otherwise.

For measuring **perceived benefits**, in the survey the firm was asked if *“Do you expect that ICT will have a high impact, medium impact, low impact or no impact on the following business functions in your company in the future? What about management and controlling? Administration and accounting? Marketing and customer services? Logistics?”*. Categorical variables were created for each answer with a four-point scale that takes the value 4 for high impact and 1 for no impact.

One of the independent variable is **firm size**. The dataset contains information about the number of employees in the firms. We can distinguish among large and small and medium-sized enterprises (SMEs). SMEs are non-subsidary, independent firms which employ less than a given number of employees; this number varies across countries. The most frequent upper limit designating an SME is 250 employees, as seen in the European Union. Following the EU classification (OECD, 2005), we have created different groups according to the number of employees: micro (less than 10 employees), small enterprises (10-49 employees), medium-sized enterprises (50-249 employees) and large enterprises (more than 250 employees).

The survey also has some questions related to **IT expertise**. Firms were asked whether the company hires ICT practitioners to take care of the company infrastructure. With this question we have generated a dummy variable.

The variable related to **external pressure** is obtained from two questions, the first one is related to the customers' pressure to adopt e-commerce, and the second one is related to the suppliers' pressure. In the survey the firm was asked if *“Has your company ever experienced pressure from customers to adopt e-commerce, which is the sale of products and services over the internet?”* and *“Has your company experienced pressure from suppliers that your ICT solutions or data exchange formats should be adapted to comply with their requirements?”*. Dummy variables were created for each answer with value 1 for positive answers and 0 otherwise.

Related to **competitive pressure**, in the survey there are the following questions: *“Do you agree (yes) or disagree (no) to Our market position is threatened by new entrants.* A dummy variable was created taking value 1 for yes and 0 for no.

One of our aims is to understand differences of e-business adoption across groups of countries. Based on the level of e-commerce adoption, we have decided to create two groups of countries, those whose level of e-commerce adoption is above the European mean, and those below the mean. The following table (table 1) shows the level of individuals using internet for ordering goods or services from 2004 and 2009. Our interest is focused on the year 2007, the year the interviews were carried out. One group of analysis covers Germany, Sweden, UK and France and the other group covers Spain, Italy and Poland. The results will be presented for each group.

TABLE 1  
Individuals using the Internet for ordering goods or services (%)

	2004	2005	2006	2007	2008	2009
<b>Germany</b>	37	42	49	52	53	56
<b>Sweden</b>	43	50	55	53	53	63
<b>United Kingdom</b>	37	44	45	53	57	66
<b>France</b>	:	:	22	35	40	45
<b>Spain</b>	8	12	15	18	20	23
<b>Italy</b>	:	6	9	10	11	12
<b>Poland</b>	5	7	12	16	18	23
EU (27 countries)	20	24	26	30	32	37

Source: [http://epp.eurostat.ec.europa.eu/portal/page/portal/information\\_society/data/main\\_tables](http://epp.eurostat.ec.europa.eu/portal/page/portal/information_society/data/main_tables)

The table 2 shows the frequency of each variable we have used in the next analysis. To gain a better understanding of these items, we compare the values across the two samples. For these comparisons we use Z scores or t-statistics test depending on the nature of the data. The null hypothesis of each comparison is that the two variables have the same mean. The significant test rejects it. In this table, we compare the two countries in terms of firm changes, use of e-business, level of IT employees, the benefits perceived by the use of the e-business, the customers and suppliers pressure and the competitive pressure perceived by the firms.

According to our results, some significant differences are found in terms of changes in management, the use of e-business, expected benefits in management and marketing, the level of IT employees and in the customer pressures.

TABLE 2  
Proportion for key variables and comparison test

		Low e-commerce	High e-commerce	Comparison
<b>Variable</b>	<b>Indicator</b>			
<b>Firm changes</b>	Corporate strategy change	21.14	23.07	Z=-0.38ns
	Management change	23.50	22.25	Z= 2.314**
	Marketing tactics change	26.40	28.46	Z= 0.328 n.s.
<b>E-business adoption</b>	Conducting e-business	29.76	16.79	Z= 11.31***
<b>Firm size</b>	Micro	10.07	11.87	Z= -3.07**
	Small	53.44	51.33	Z= 5.88***
	Medium	29.12	29.83	Z= 0.22 n.s.
	Large	7.35	6.96	Z= 1.52*
<b>ICT expertise</b>	IT employees	25.77	21.70	Z= 3.66***
<b>Expected benefits</b>	Expected benefits management	3.80	3.53	t= 7.48***
	Expected benefits accounting	3.94	3.90	t=1.03 n.s.
	Expected benefits marketing	3.81	3.62	t=5.27***
	Expected benefits logistics	3.76	3.71	t=1.13 n.s.
<b>Pressure</b>	Pressure customers	14.33	24.70	Z= -6.343***
	Pressure suppliers	10.61	10.30	Z= 0.724 n.s.
<b>Competitive pressure</b>	Market position threaten by new entrants	51.92	46.25	Z= 0.965 n.s.

\* significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level, n.s. non-significant

## 5. Results

We have used a seemingly unrelated bivariate probit estimation. The tables 3 and 4 present the drivers for conducting e-business and the effect of this decision on different kind of organizational implication.



Analyzing the factors that explain firm changes, results are quite robust across countries. Conducting e-business is a key factor that impact management, strategic and marketing changes. So, **H1, H2, H3 are supported for both samples**. In terms of competitive pressure, the threat of losing the market position has different impact for each sample. For countries with high level of e-commerce, it implies changes in management, while for countries with low level of e-commerce, it is related to strategic changes. Finally, size impact is different depending on the kind of change and sample analyzed. Middle size firms are more likely to develop strategic changes. Furthermore, large firms have also a greater likelihood to make strategic changes in countries with low level of e-commerce diffusion. For these countries, small firms are less likely to develop changes in marketing.

Related to the factors that influence the extent of conducting e-business, human resources, size, perceived benefits of that decision and environmental factors are important.

The results show that hiring specialized IT personnel in the firm is an important factor that helps firms to conduct e-business in all the cases analyzed. So, as we expected, the level of IT knowledge available in the firm has a strong influence on conducting e-business in a greater extent, what **supports H4 in both samples**. Furthermore, this influence is greater in countries with low level of e-commerce diffusion. Its coefficients double the ones obtained in the other sample.

Firm size is important on conducting e-business only for the sample with countries with low level of e-commerce adoption. However, contrary to what we expected, micro-small firms have a greater probability of conducting e-business compared to other firm sizes. Although large firms show a positive effect on conducting e-business, this effect is not significant. So, this **rejects H5 in both samples**.

The expected benefits of conducting e-business are another important factor in conducting e-business. Results about this factor are similar in both samples. According to our findings not all the expected benefits have the same influence. According to our results, the expected benefits in management, marketing and logistics are the main reasons for using e-business. The benefits related to the accounting process are not significant in any of the regressions. So, **H6 is supported only partially**.

Related to the pressure of stakeholders, we have included customers and suppliers' pressures. None of these partners impact the level of e-business use. So, **H7 is rejected in both samples**. Finally, the competitive pressure has a different impact depending on the sample analyzed. While for the sample that contains countries with high level of e-commerce it is positive but not significant, for the other sample, it has a negative and significant impact. This means that the competitive pressure has a negative impact on the decision of using e-business. So, **H8 is rejected in both samples**.

TABLE 3  
Results for France, Germany, UK, Sweden

			Management change	Strategic change	Marketing change
Hypotheses			Coefficients	Coefficients	Coefficients
<b>H1, H2, H3</b>	<b>Accepted</b>	Conducting e-business	1.639*** (0.23)	1.824** (.245)	1.979*** (0.14)
		Market Position threatened	.1957* (0.10)	.037 (0.11)	-.093 (0.10)
		1-9 employees	-.1402 (0.14)	-.080 (0.15)	.109 (0.13)
		50-249 employees	-.0137 (0.146)	.164*** (0.14)	.071 (0.13)
		+250 employees	0.095 (0.23)	.100 (0.23)	-.237 (0.22)
		Constant	-1.03*** (0.12)	-1.116*** (0.12)	-.769*** (0.11)
		<b>Conducting e-business</b>			
<b>H4</b>	<b>Accepted</b>	IT employees	.4587*** (0.14)	.409*** (0.14)	.496*** (0.14)
<b>H5</b>	<b>Rejected</b>	1-9 employees	-0.056 (0.16)	-.083 (0.16)	-.097 (0.16)
		50-249 employees	-.169 (0.16)	-.139 (0.16)	-.117 (0.16)
		+250 employees	.096 (.27)	.047 (0.27)	.192 (0.25)
<b>H6</b>	<b>Partially accepted</b>	Expected benefits management	.202*** (.07)	.163*** (0.07)	.101 (0.07)
		Expected benefits marketing	.089 (.070)	.137** (0.06)	.256*** (0.06)
		Expected benefits logistics	.232** (0.07)	.244*** (0.07)	.149** (0.06)
		Expected benefits accounting	-.0413 (.088)	-.043 (0.08)	-.0168 (0.07)
<b>H7</b>	<b>Rejected</b>	Pressure customers	.176 (0.16)	.174 (0.16)	.162 (0.15)
		Pressure suppliers	.099 (0.18)	-.067 (0.19)	.187 (0.16)
<b>H8</b>	<b>Rejected</b>	Market Position threatened	.087 (0.13)	.055 (0.13)	.074 (0.13)
		Constant	-3.93*** (0.38)	-2.975*** (0.38)	-2.978*** (0.36)
		Rho	-.707*** (0.13)	-.768*** (0.13)	-.886*** (0.08)
		Loglikelihood	-505.677***	-499.38***	-549.67***
		Number obs.	560	562	558
		AIC	1055.274	1040.759	1144.637

\* significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level , n.s. non-significant

TABLE 4  
Results for Spain, Italy and Poland

			Management change	Strategic change	Marketing change
Hypotheses			Coefficients	Coefficients	Coefficients
<b>H1, H2, H3</b>	<b>Accepted</b>	Conducting e-business	1.37*** (0.20)	1.345*** (.20)	1.403*** (0.23)
		Market Position threatened	.213 (0.14)	.241* (0.14)	.139 (0.14)
		1-9 employees	-.344 (0.19)	-.132 (0.19)	-.459** (0.19)
		50-249 employees	0.168 (0.17)	.422** (0.18)	.069 (0.17)
		+250 employees	-0.073 (0.29)	.541* (0.28)	.275 (0.29)
		Constant	-1.13*** (0.16)	-1.40*** (0.17)	-1.03*** (0.16)
<b>Conducting e-business</b>					
<b>H4</b>	<b>Accepted</b>	IT employees	.988*** (0.17)	1.025*** (0.16)	.866*** (0.17)
<b>H5</b>	<b>Rejected</b>	1-9 employees	.418** (0.20)	.468** (0.20)	.491** (0.20)
		50-249 employees	-.161 (0.19)	-.052 (0.19)	-.046 (0.19)
		+250 employees	-.135 (.33)	-.198 (0.33)	-.0117 (0.34)
<b>H6</b>	<b>Partially accepted</b>	Expected benefits management	.208** (.01)	.160* (0.09)	.157* (0.08)
		Expected benefits marketing	.096 (.010)	.098 (0.10)	.203** (0.09)
		Expected benefits logistics	.162** (0.09)	.171* (0.09)	.143 (0.09)
		Expected benefits accounting	.056 (.09)	.065 (0.09)	.035 (0.09)
<b>H7</b>	<b>Rejected</b>	Pressure customers	.169 (0.25)	.164 (0.23)	-.076 (0.24)
		Pressure suppliers	.209 (0.20)	.186 (0.19)	.282 (0.19)
<b>H8</b>	<b>Rejected</b>	Market Position threatened	-.471*** (0.15)	-.384** (0.15)	-.408** (0.15)
		Constant	-2.580*** (0.43)	-2.582*** (0.44)	-2.733*** (0.44)
		Rho	-.653*** (0.12)	-.737*** (0.11)	-.648*** (0.16)
		Loglikelihood	-362.04***	-352.157***	-368.73***
		Number obs.	341	341	340
		AIC	763.3688	741.9069	775.6377

\* significant at 0.10 level; \*\* significant at 0.05 level; \*\*\* significant at 0.01 level , n.s. non-significant

## 6. Discussion

### *Main findings*

The aim of this research is to deep into the antecedents of conducting e-business and its organizational implications within the firm. Research has pointed out that conducting e-business implies to make some changes in management, strategy and marketing. However, little empirical research has supported this idea. We have used a data set of 691 retailers from seven European countries to test the hypotheses. We have created two samples depending on the level of adoption of e-commerce in each country. One of the samples contains countries with high

level of e-commerce adoption and the other sample, countries with low level of e-commerce adoption.

The model we have tested seems to fit better the sample that represents countries with low level of e-commerce adoption by individuals. So, this result suggests that firms have adopted e-business although only a small proportion of their customers order products or services online. We expected a contrary result, being those firms that operate in countries with high level of e-commerce adoption by individual, the ones that adopted the e-business in a greater extent. So, firms in Spain, Poland and Italy seem to be ahead of the evolution and diffusion of the technologies in their countries.

The research found that the hypotheses regarding the organizational implications of e-business use have been fully confirmed. This result confirms previous research that suggests that the adoption and use of the e-business involves a strategic change (Yasin et al., 2006; Venkatraman, 1994), a management change (Croom, 2005) and a change in marketing tactics (Kalyanam and McIntyre, 2002). No matter the countries analyzed, this result is robust. The extent of e-business use exhibits greater organizational implications in countries with high level of e-commerce adoption than in the sample that contains Spain, Italy and Poland.

The environment involves also a pressure to adapt the firm strategy and management, what confirms previous studies (Grant, 2003). Firms with a perceived greater competitive pressure are more likely to make changes in their strategy and management. However, the firm characteristics, such as size, does not influence firm changes. The exceptions are medium-sized firms that engage strategic changes. This result supports previous research (Chen and Hambrick, 1995). In countries with low e-commerce adoption, large firms engage strategic changes and small firms have less probability to undertake marketing changes. So, the effect of size not only depends on the kind of change analyzed, but also on the countries. So, more research is needed to have a better understanding of this variable.

We have included in our analyses the study of the antecedents of using e-business. Our results confirm some previous findings but also contradict others. The findings also offer insights about how the effects may vary across different environments.

Organizational aspects are factors with a strong and clear impact on the decision of conducting e-business. This confirms previous studies that suggest that internal and human resources are the main factors in the adoption of e-technologies and e-business (Srinivasan, Lillien and Rangaswamy, 2002; Del Aguila and Padilla, 2006) and they are strongly related to e-business value (Zhu *et al.*, 2004). As previous research suggested, IT expertise is an important resource that increases the likelihood of conducting e-business in a greater extent. Size, is another factor included in the analysis of e-business adoption. The impact depends on the sample analyzed. For high level of e-commerce adoption countries, size is not significant. However, for the other sample, our findings suggest that micro-small firms are the ones with greater likelihood of conducting e-business in a greater extent. These results are contrary to some research that suggests that large firms are the ones that adopt and use e-business in a greater extent. However, this finding is in line with previous research that suggests that small firms are more flexible (Auger and Gallagher 1997; Ghosh, 1998) and e-technologies help those firms to compete with large firms (Zhu *et al.*, 2004). This makes small firms to undertake more innovations. Because in this sample, perceived competitive pressure seems to be greater, smaller firms may benefit from their flexibility.

Technological factor includes the main benefits of using the e-business. Previous research found a significant effect of this factor (Dubelaar *et al.*, 2005; Grandon and Pearson, 2004). Previous research used reflective constructs, so they have only the impact of the whole construct. In our case, we have included different items that do not have to be related among them, so firms may find that e-business may have some benefits in concrete functions and not in all of them. This allows us to find that the main expected benefits of using e-technologies are related to the management of the firm, marketing and logistic functions. Our results confirm that expected benefits are important drivers for explaining the level of e-business use, but not all the benefits

have the same importance. Although firms may benefit from reducing the costs of accounting and administration, this is not a reason for using e-business in a greater extent. The expected impact of ICTs on management, marketing and customer services, and logistics are the main reasons for using these technologies.

Environmental factors have a small influence in the level of conducting e-business. Our findings suggest that suppliers and customers' pressure has no influence in the level of e-business use. This is contrary to previous results (Prekumar and Ramamurthy, 1995; Prekumar and Roberts, 1999; Kuan y Chau, 2001; Soliman and Janz, 2004). A contradictory result is found with the non-significant influence of customers' pressure in countries with high level of e-commerce adoption among individuals. We expected that in those countries, customers would have had an influence and made pressure to the adoption of e-commerce by firms. As the sector analysed is retailing we expected a strategic response from the customers' needs. Related to the perceived competitive pressure, it is only important in countries with low level of e-commerce adoption. The explanation for this result could be that in some situations competition increases uncertainty what may inhibit the decision of innovate (Fuentelsaz *et al.*, 2003). The risk is greater than the expected benefits, what makes firms to wait a move from competitors.

### ***Contributions and implications to research***

Our research contributes with new evidence to the marketing and e-technologies literature confirming that conducting e-business is an integrated decision that influences on all the aspects of the business. Some research has suggested that e-business has an effect on changing the marketing strategy and tactics. However, most of these studies are theoretical or case studies. Our paper contributes to previous research with empirical evidence of the impact of conducting e-business in different aspects: management, marketing and customer service and firm strategy. Our results suggest that the level of e-technologies usage impact in all of them in the same way. So, managers should take into account that if they decide to conduct e-business, this decision will impact in the whole firm provoking a restructuration and re-organization of the business and a change in the strategy. For this reason, the decision of conducting e-business should be addressed as a strategic decision due to its strong impact on the firm.

A second contribution of this research is our extension of the existing literature on organizational adoption of innovations. Our result related to the importance of internal capabilities to the likelihood of conducting e-business in a greater extent compared to the external pressures suggests that firms proactively seek technologies of their own volition. Including internal and external factors in the decision of conducting e-business allows us to study an integrated model of technology adoption.

Finally, this research provides a cross-country analysis, showing some differences of e-business adoption level across European countries. Previous research has showed evidences of these differences (Zhu *et al.*, 2003; Koellinger, 2008; Oliveira and Martins, 2010). Our contribution in this field is twofold: first, we present some new evidences on the factors that influence the extent of e-business adoption, and second, we offer empirical evidences of the consequences of e-business use across countries

### ***Limitations and future research***

The main limitations of the study lie in the nature of the information and data used. First, we have used a general question to know the level of use of e-business, however the adoption and use of each type of ICT is different. Previous research suggested that the adoption and use of e-business is a dynamic process and that firms follow some steps. So, the level of conducting e-business among firms could be very different. Future research could address this issue, analyzing the decision as a process with different steps.

Secondly and related to the previous limitation, data is cross-sectional. We have no information about the evolution of the organizational strategies analyzed in this paper. Future research should be aimed at conducting a dynamic analysis of the subjects. In this way it could be

possible to analyze the effect of the changes in those decisions in the level of e-business adoption (Jeyaraj et al., 2009).

The third limitation is that data contains information from different countries which may have different e-business adoption rates. We have split the data in two samples but in future research we could analyze each European country separately to understand whether there are some differences among them.

Future research should be aimed at adding performance measures that may link the type of changes made within the firm with some economic results. Previous research has analyzed the effect of e-business usage on performance, but successful firms would be those that are able to re-structure and re-organise efficiently to maximize the benefits of e-business use.

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