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Innovation or imitation? The role of organizational culture

Innovation or
imitation?

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Abstract

Purpose – Innovation is crucial for attaining a competitive advantage for companies. Innovation, versus imitation, motivates companies to launch new products and become pioneers on markets. Many factors have been shown to be determinants for supporting an organizational innovative orientation. One of them is organizational culture. The objective of this paper is to analyze the organizational culture that fosters or inhibits organizational innovation and imitation strategy.

Design/methodology/approach – The paper uses a sample of 471 Spanish companies for examining the hypotheses. Using hierarchical multiple regression analysis, it relates the effect of organizational culture with an innovation strategy.

Findings – The results confirm the hypotheses. The paper finds that organizational culture is a clear determinant of innovation strategy. Moreover, adhocracy cultures foster innovation strategies and hierarchical cultures promote imitation cultures.

Research limitations/implications – The main limitations are that data in the study were collected from one source for the cross-sectional design of this research.

Practical implications – Managers should pay more attention to their organization culture if they pursue innovation/imitation strategies. Moreover, depending on this orientation (to be the first company to introduce in new markets or develop new products for a market versus to follow a pioneer), companies should promote different values and norms in their organizations.

Originality/value – The main value of this paper is its analysis and testing of the relation of organizational culture and innovation orientation. The majority of the literature underlines the paper's seeking after organizational culture for innovation. However, this topic has not been studied in depth and requires attention to different organizational cultures and innovation orientations.

Keywords Organizational culture, Innovation, Spain

Paper type Research paper

Introduction

Discontinuities in the environment firms have to face today are difficult to manage because they demand different product architectures, change the economics of the industry, destroy existing firm competences, create new value networks in which to compete and require technology investments with highly uncertain outcomes. In this context, companies' success depends on their innovative capability (1995, Henderson



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and Clark, 1990; Lieberman and Montgomery, 1998; Schumpeter, 1934, Schumpeter, 1942; Tushman and Nadler, 1986; Utterback, 1994). Furthermore, according to the literature, the effect of innovation on performance differs depending on its strategic orientation, and whether the firm is a market pioneer or a follower. Some studies have found that pioneer companies's performance is better (e.g. Kerin *et al.*, 1992; Langerak and Hultink, 2008; Robinson and Fornell, 1985, Zhou, 2006).

This scenario has led to increased interest among researchers who wish to gain a better understanding of how to improve the capacity of firms to innovate (Damanpour, 1987; Damanpour, 1996; Koc and Ceylan, 2007; Mavondo *et al.*, 2005) and how to develop pioneering innovations. Today one of the variables considered to have a significant influence on innovation is organizational culture (Carmeli, 2005). Since it influences employee behaviour, it may lead them to accept innovation as a fundamental value of the organization and to feel more involved in the business (Hartmann, 2006). Consequently, the literature considers organizational culture to be one of the factors that can stimulate the most an innovative behaviour among the members of the organization (Ahmed, 1998; Ekvall, 1996; Martins and Terblanche, 2003; McLean, 2005; Mumford, 2000). Furthermore, we suggest that different organizational cultures will be required depending on the innovation strategic orientation of the firm, innovative or imitative.

Despite the importance given to culture as a stimulant for innovation, empirical research remains somewhat limited. Only a few studies have focused on the effect of culture on innovation and most of them have focused on some cultural characteristics not on archetypes of culture values. Besides, previous research has been mainly carried out in the USA. There is a lack of studies on the relation between culture and innovation using European firms. Finally, the studies focusing on the relation between organizational culture and the innovation orientation of the firm, imitation, versus innovation, are still rarer.

This paper fills this gap in the literature. First, we review the literature on this topic. Then, this study empirically examines the relationship between organizational culture and the innovation orientation of the firm using a sample of 471 Spanish firms. Finally, we present the paper conclusions, limitations and the recommendations for future research.

Theoretical framework

Research on the strategic orientation towards innovation has been getting more attention in the literature (Atuahene-Gima and Ko, 2001) and there is evidence of its effects on firm performance.

In general, literature distinguishes between innovation orientation and imitation orientation (Zhou, 2006). Innovation orientation refers to a firm that has a strategy of developing and introducing innovative new products or services into the market before their competitors (Kerin *et al.*, 1992). In contrast with this, companies with an imitation orientation, try to avoid the exorbitant costs associated with basic scientific investigation and the development of novel technologies and adopt competitor's ideas and technology. They cannot attempt to redefine product markets with products that are new to the world and, thereby render the competition irrelevant (Lukas and Ferrell, 2000). The literature calls companies with an innovation orientation as early market entrants' or market pioneers' while companies with an imitative orientation have been

labelled as later entrants' or followers' (Ali *et al.*, 1995; Atuahene-Gima and Ko, 2001; Bowman and Gatignon, 1996; Lieberman and Montgomery, 1998; Manu, 1992; Mascarenhas, 1992; Robinson *et al.*, 1992; Robinson and Fornell, 1985).

Innovation orientation is a basic element of market entry strategy. Ali *et al.* (1995), following Robinson (1990), consider that market pioneer (innovation orientation) is one of four entry strategy variables, together with product advantage, relative promotional effort, and relative price. On the other hand, Manu (1992) considers the timing of market entry as the main component of the "innovation orientation". Kerin *et al.* (1992) say that innovation orientation is comparable with the pioneer character defined by Miles and Snow (1978) when defining prospector and analyzer strategies. According to Lilien and Yoon (1990), the timing of market entry does not have only a quantitative character (tactical decision) but it also has a qualitative character that is closely connected with strategic decision. "The qualitative decision is typically addressed as an entry-strategic problem: should a firm try to be pioneer or a follower?" (Lilien and Yoon, 1990).

Innovation and imitation strategies are both viable. Innovation is not the only choice for a product introduction, because there can be only one pioneer in any product market, imitation remains a viable and more common strategy than innovation (Zhou, 2006). Bolton (1993) notes that although numerous studies confirm that order of entry does give an economic advantage to pioneers, a consequence of greater brand loyalty and lower production and advertising costs, this only happens if followers do not substantially improve product performance or marketing efficiency. While innovators have the potential to create markets, shape consumer preferences, and even change consumers' basic behaviour (Zhou, 2006), imitators have the opportunity to identify a superior position and introduce improved products to serve customers better (Shankar *et al.*, 1999) in so far as imitation costs often are much lower than innovation costs because an imitator does not, for example, need to spend as many resources on research; the existing products already provide imitators with information for their product development (Schnaars, 1994).

Past research on the market timing or entry decision issue have focused on analyzing the effects of "entry timing" on performance (Iyer *et al.*, 2006; Kerin *et al.*, 1992; Ozer, 2006; Robinson and Fornell, 1985; Zhou, 2006). However, there are few empirical studies that show factors, which affect entry timing (Schoenecker and Cooper, 1998). Different authors have indicated that there are differences in the attributes, skill and resource profiles of pioneer firms and followers (Lieberman and Montgomery, 1998; Murthi *et al.*, 1996; Robinson *et al.*, 1992; Schoenecker and Cooper, 1998). They found that market pioneers had significantly different skill and resource profiles than later entrants (Robinson *et al.*, 1992). From this perspective the literature has pointed out as determinants of entry timing specialized assets (Mitchell, 1991), superior capabilities and competences (Lieberman and Montgomery, 1998), intense research and development, internal financial resources, direct sales force (Schoenecker and Cooper, 1998), and organizational design and culture (Droge *et al.*, 2008; Matsuno *et al.*, 2002).

Regarding organizational culture, there is an agreement in the literature about its importance for innovation (Chang and Lee, 2007; Higgins and McAllaster, 2002; Lau and Ngo, 2004; Lloréns Montes *et al.*, 2004; Martins and Terblanche, 2003; Mumford, 2000; Obenchain and Johnson, 2004; Ruigrok and Achtenhagen, 1999). In order to

innovate and adopt technological progress successfully, firms have to meet certain requirements in terms of their internal behaviour and their external relationships (Tylecote, 1996). Furthermore, Sigauw *et al.* (2006) point out the organizational culture as a facet of operational competency shaped by the innovation orientation of the firm.

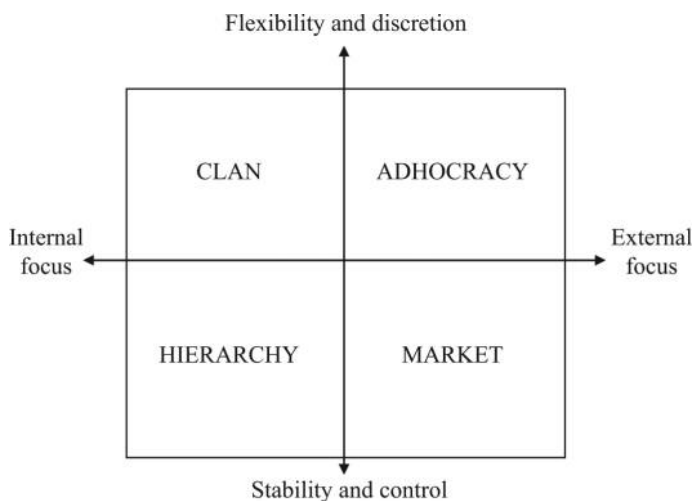
Organizational culture can be defined as the values, beliefs and hidden assumptions that organizational members have in common (Cameron and Quinn, 1999; Denison, 1990; Deshpandé and Webster, 1989; Miron *et al.*, 2004). Various research works have been conclusive as to the key role of culture in innovation (Ahmed, 1998; Higgins and McAllaster, 2002; Jamrog *et al.*, 2006; Jassawalla and Sashittal, 2002; Lau and Ngo, 2004; Martins and Terblanche, 2003; Mumford, 2000). The main reason is that it can stimulate innovative behaviour among the members of an organization since it can lead them to accept innovation as a basic value of the organization and can foster commitment to it (Hartmann, 2006). Furthermore, cultural aspects and management behaviour are closely related and can be serious impediments to change (Boonstra and Vink, 1996). According to Tesluk *et al.* (1997) the basic elements of culture have a twofold effect on innovation – from the perspectives of socialization and of co-ordination. Through socialization, individuals can know whether creative and innovative behaviours are part of the path the business treads. At the same time, the business can, through activities, policies and procedures, generate values, which support creativity and innovation, and its innovative capacity will subsequently improve.

What the literature has not clarified is which types of culture enhance or inhibit innovation. Moreover, there is a lack of empirical research analyzing whether different innovation strategic orientations – innovation orientation versus imitation orientation – require different types of organizational culture.

In order to analyse this issue, we use the model proposed by Cameron and Quinn (1999), the Competing Values Framework (CVF). Although there are other typologies of organizational culture (Kets De Vries and Miller, 1986; Reigle, 2001; Wallach, 1983), the CVF is one of the most extensive and has been used in some empirical studies on organizational culture (Deshpandé *et al.*, 1993; Igo and Skitmore, 2006; Lau and Ngo, 2004; Obenchain and Johnson, 2004; Stock *et al.*, 2007).

Cameron and Quinn (1999) propose a model (Competing Values Framework) that defines four cultures – adhocracy, clan, market and hierarchy – using two dimensions (see Figure 1): flexibility and discretion versus stability and control, and external focus versus internal focus and integration. Using these dimensions and six characteristics of the organization – dominant characteristics, organizational leadership, management of employees, organizational glue, strategic emphases and criteria of success – they define four types of organizational cultures.

According to this model, adhocracy culture emphasizes flexibility and change and it is externally oriented. It is usual in companies operating in dynamic contexts and in those trying to be the leaders in their markets. The key values that adhocracy culture emphasizes are creativity, entrepreneurship and risk taking. Clan culture also emphasizes also flexibility but its focus is on the internal organization. Characteristics of clan-type firms are teamwork, employee involvement and corporate commitment to employees. Market culture is externally focused, but it is control oriented. The core values of firms with this culture are productivity and competitiveness. Finally, hierarchy culture is also control oriented but also focuses on the internal organization.



Source: Cameron and Quinn (1999)

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Figure 1.
Organizational cultures
typology of Cameron and
Quinn (1999)

Efficiency, coordination and close adherence to rules and regulations are its main characteristics.

In order to identify which organizational culture types have a positive effect on innovative or imitative orientation, we examine the dimensions of the model. In the case of the first dimension of the model, stability/flexibility, it is to be expected that flexibility-oriented cultures will favour innovative orientation, while stability-oriented will hinder it. This is due to the fact that flexibility, lack of formality and organic structures imply a proactive strategic orientation (Matsuno *et al.*, 2002) since autonomy and freedom encourage creativity, which is the key for developing pioneer innovations.

Creativity can be understood as the ability to perform work in a novel and appropriate way, i.e. useful (McLean, 2005) or to generate new and valuable ideas (Amabile, 1998). This has not only been mentioned frequently in the literature as a key feature of an innovative culture (Claver *et al.*, 1998; Jamrog *et al.*, 2006; Martins and Terblanche, 2003; McLean, 2005; Mostafa, 2005; Schneider *et al.*, 1994; Shrivastava and Souder, 1987; Wallach, 1983) but it has been suggested as a determinant of the pioneer character of the firm. Furthermore, Ford and Ogilvie (1996) suggests that routine and creative acts have significant implications for knowledge processes, which lead to different organizational learning outcomes. According to Baker and Sinkula (2007), generative learning processes – in which creativity is the constant – are more associated with innovative orientation than imitative orientation. Finally, employee willingness to use and share knowledge enables the firm to improve innovation capability (Lin, 2007).

On the other hand, the existence of rules and regulations (i.e. formalization of activities) and excessive authority and poor participation of members (i.e. centralization) limit the capacity of the members to assume the risks of innovation (Child, 1973). Therefore, there are unfavourable conditions for finding new managerial opportunities. Bureaucratic control is exercised through the use of rules and procedures, hierarchies of authority and other mechanisms to standardize and

assess outputs (Ouchi, 1979) to achieve efficiency. Efficient-bureaucratic firms achieve efficiency by “playing it safe” and striving for certainty in their internal operations (Covin and Slevin, 1989), i.e. imitative orientation. From this, it can be concluded that a flexibility-orientation favours innovation orientation while a stability-oriented favours imitative orientation.

In the case of the second dimension, internal focus/external focus, the literature suggests that externally oriented cultures will be associated with innovation orientation, while internally oriented cultures will be associated to the imitation orientation. Lukas and Ferrell (2000) point out that market orientation enables a business to anticipate changing market conditions and respond to market requirements. Likewise Droge *et al.* (2008) indicate that a proactive strategic orientation needs an increased level of market orientation to identify new market opportunities and act on those opportunities. In the same way, Kimberly and Evanisko (1981) and Detert *et al.* (2000) suggest that outwardly oriented businesses usually have a variety of mechanisms to increase their chances of obtaining information about their business environment that firm will favour the generation of innovation within the business. To sum up, if the firm emphasizes external orientation as opposed to internal, it will obtain breakthrough innovations, with levels of risk (Baker and Sinkula, 2007; Matsuno *et al.*, 2002), and as a consequence, a competitively aggressive position (Cooper *et al.*, 1989).

The deduction from the above discussion is that the type of organizational culture in the Cameron and Quinn (1999) model which most favours innovation orientation is the adhocracy one since its most characteristic values are flexibility, creativity and external orientation. Hierarchical culture, characterized by stability and internal orientation will support an imitation orientation more (Bolton, 1993). In consequence, we propose:

H1. Adhocracy culture will have a positive effect on innovative orientation

H2. Hierarchy culture will have a positive effect on imitative orientation

Methodology

Data collection and sample

Data for this study comes from a more extensive research, financed by the European Union (FEDER funds). The population included manufacturing Spanish organizations with more than 15 employees located in the southeast of this country. It was designed to cover a range of industrial sectors. According to SABI (a data base which contains financial information for 480,000 Spanish companies, with up to ten years of data, updated daily), the population was composed of 787 companies.

The information was collected via personal interview with CEOs of companies, using a previously tested questionnaire. In total, 471 valid questionnaires were obtained, yielding a response rate of 59.84 per cent. Respondent and non-respondent companies were compared in terms of size and performance. No significant differences were found between those two groups, suggesting no response bias.

Measures

Innovative vs imitative orientation: The organizational strategic orientation to innovation or imitation has been measured in terms of market pioneering or pioneer

character (Ali *et al.*, 1995; Atuahene-Gima and Ko, 2001; Manu, 1992) and clever response to the changes introduced by rivals (Langerak and Hultink, 2008). Other authors have used similar measures, emphasizing the rapid response to competitors' actions (Zhou, 2006) or the importance of being the first company to introduce or bring innovative products to the market (Zhou *et al.*, 2005). Since this technological innovation includes both product and process innovation, we use these two measures for each type of innovation. They cover the proactive or reactive character of those innovations and the level of opportunity in the response to the changes introduced by rivals. Perceptions of managers were measured using a five-point Likert scale (1 = strong disagreement; 5 = strong agreement) ($\alpha = 0.850$). Then, we combine these scales for measuring technical innovation orientation to innovative or imitative. Higher values of this variable show a stronger innovative orientation of the company, while lower values represent a stronger imitative posture.

Organizational culture: Our measure of organizational culture is based on the Organizational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn (1999). This measure has been used in previous research on organizational culture (Deshpandé *et al.*, 1993; Lau and Ngo, 2004; Muijen *et al.*, 1999; Obenchain and Johnson, 2004; Obenchain, 2002) and several authors have validated it (Howard, 1988; Quinn and Spreitzer, 1991). We use four of the six key dimensions of organizational culture the OCAI proposes: dominant-characteristics, management of employees, organization glue and criteria of success. We did not have information about the other two dimensions: leadership style and strategic focus. The former is strongly related to the management of employee dimension and the latter is similar to the criteria of success dimension. Thus, our measure can be considered as valid even though we excluded those two dimensions. Other previous studies have also measured organizational culture using fewer dimensions than the OCAI model proposes (Deshpandé *et al.*, 1993; Lau and Ngo, 2004; Obenchain and Johnson, 2004; Obenchain, 2002).

Following the OCAI methodology, we include 16 items in the questionnaire organized into four parts (corresponding to the four dimensions used) with four descriptions in each part (see the Appendix). The four descriptions matched the definitions of each of the four culture types of the Cameron and Quinn (1999) model: adhocracy, clan, market and hierarchy. Respondents were asked to allocate 100 points to the four parts depending on how similar the descriptions were to their organization. Scores for each of the two culture types were first transformed into five-point scales, following Dutch (2004). Finally, the scores were added for the elements corresponding to the adhocracy culture and hierarchy culture.

Control variables: Two control variables were included in the analyses, firm size (number of employees), and company age, as they are frequently related to innovation and culture (Lau and Ngo, 2004; Lin and Chen, 2006; O'Reilly *et al.*, 1991).

Table I provides information regarding the mean values, standard deviations and bivariate correlations between the variables.

Statistical analysis

The hypotheses were tested using hierarchical regression analysis. The test is based on changes in the level of explained variation before and after the variable of interest is added to the set of control variables. Significant changes in the adjusted R^2 provide

support for the hypotheses when the regression coefficient (β) of the independent variables is significant and has the predicted sign.

Results

In the two hypotheses of this study, we propose that organizational culture will affect the orientation toward innovation. In particular adhocracy cultures will have a positive effect on innovative orientation, while hierarchical cultures will foster an imitative orientation. In order to test these hypotheses, the two types of organizational culture were independently entered into the equation after the control variables had been included. Table II shows the results obtained.

As can be seen, when passing from model 0 (which only includes control variables), to models 1 and 2 (which include the adhocracy and hierarchy cultures, respectively), the increases of R^2 are significant. In addition, taking into account the β coefficients, we can conclude that, as predicted, adhocracy culture is positively related to innovative orientation and hierarchy culture is positively linked to imitative orientation. In summary, these results provide support for *H1* and *H2*.

In order to study the relation between these two types of organizational culture and the innovation orientation of the firm more in depth, we conducted additional analyses. In particular, we analyzed the effect of each dimension of the two culture types on the innovation versus imitation variable, again using hierarchical regression analysis. Table III shows the results.

Some interesting conclusions derive from our findings. First, they show that not all the dimensions of each culture have the same effect on the innovation orientation of the firm. Second, they allow us to identify which dimensions are responsible for both the

Table I.
Means, standard deviations and correlations among variables

Variables	Mean	SD	1	2	3	4	5
Size	58.780	154.01	1				
Age	37.730	189.483	-0.013	1			
Adhocracy	36.771	19.859	-0.060*	-0.024	1		
Hierarchy	24.348	15.211	-0.08	-0.035	-0.553***	1	
Innovative orientation	3.426	0.714	0.095***	-0.063*	-0.020	-0.189***	1

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table II.
Results of hierarchical regression analysis for *H1* and *H2*

Y = Innovative orientation (vs imitative orientation)			
Variables	Model 0	Model 1	Model 2
Size	0.121**	0.102**	0.122***
Age	-0.084*	-0.082*	-0.094**
Adhocracy		0.290***	
Hierarchy			-0.199***
F	4.875***	17.002***	9.446***
R ²	0.018	0.099	0.055
ΔR^2	0.022***	0.084***	0.040***

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Y = Innovative orientation (vs imitative orientation)			
Variables	Model 0	Model 3	Model 4
Size	0.121 **	0.092 **	0.124 ***
Age	-0.084 *	-0.077 *	-0.092 **
Dominant characteristics for adhocracy		0.137 ***	
Management of employees for adhocracy		-0.091 *	
Organization glue for adhocracy		0.239 ***	
Criteria of success for adhocracy		0.174 ***	
Dominant characteristics for hierarchy			0.110 **
Management of employees for hierarchy			-0.106 ***
Organization glue for hierarchy			-0.212 **
Criteria of success for hierarchy			-0.072 ***
<i>F</i>	4.875 ***	12.534 ***	0.7220 ***
<i>R</i> ²	0.018	0.137	0.079
ΔR^2	0.022 ***	0.127 ***	0.070 ***

Notes: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table III.
Results of the additional
hierarchical regression
analysis

positive effect of adhocracy culture and the negative effect of hierarchy culture on innovation orientation. In relation to adhocracy, as it were expected dominant characteristics, organization glue and criteria for success have a positive effect on innovation compared with imitation orientation. However, the second dimension of this culture, management of employees has a negative relationship with innovation orientation. With reference to hierarchy culture, three dimensions have the expected negative effect on innovation compared with imitation: management of employees, organization glue and criteria for success. However, contrary to our expectations, the first dimension of this culture – dominant characteristics – has a positive effect on innovation orientation. The implications of these findings are discussed in the next section.

Discussion

This paper focused on the link between organizational culture and the innovation strategy or innovation orientation of the firm: imitation or innovation. Although the literature suggests that organizational culture is relevant to the strategic decisions of the firm there is a lack of empirical evidence on this issue, which this paper explores.

Our findings provide support for this relationship. In particular, we found that organizational culture can affect the innovation or imitation orientation of the firm both positively and negatively. According to our findings, adhocracy cultures foster an innovation orientation while hierarchy cultures are associated with imitation. These results support the theoretical literature (Burns and Stalker, 1994; Detert *et al.*, 2000; Menzel *et al.*, 2007) and are consistent with previous empirical studies (e.g. Atuahene-Gima and Ko, 2001; De Brentani and Kleinschmidt, 2004; Droge *et al.*, 2008; Matsuno *et al.*, 2002; O'Regan *et al.*, 2006; Skerlavaj *et al.*, 2010; Yinghong and Neil, 2004).

Our findings are also similar to those studies that show that some characteristics of the hierarchy culture, such as formal structures, policies and procedures, are positively

related to imitative orientation. Lumpkin and Dess (1996) point out that it is important to remove environmental structural constraints that stifle risk taking, exploration, and out-of-the-box thinking or encourage the innovative orientation.

Although the findings are relevant and contribute to literature, the main contribution of this paper derives from the study of how each dimension or element of adhocracy and hierarchy cultures affects the innovation strategy of the firm. Our findings on this issue show that the relationship between culture and innovation strategy is complex and requires additional research.

First, the findings provide evidence that the first dimension of both cultures, organization dominant characteristics, foster an innovation orientation as opposed to an imitative one. In adhocracy culture, this dimension implies that the organization is a dynamic and entrepreneurial place where people are willing to take risks. Thus, our findings are consistent with the literature regarding adhocracy culture. According to our results, organization dominant characteristics of hierarchy culture also have a positive effect on innovation as opposed to an imitative orientation. This result is in contrast with the majority of the literature, which assumes that controlled and structured organizations enhance imitation rather than innovation (Child, 1973; De Brentani, 2001). However, recent studies have criticized this traditional assumption. For example Lieberman and Montgomery (1988) affirm that a very important capability for pioneers is learning capability and that formalization may help the company to capture previous learning, which will increase innovation (Adler and Borys, 1996). Other authors suggest that in order to enhance innovation, companies should balance a focus on dynamism and risk-taking and a focus on control (Magnusson and Martini, 2008; Soosay and Hyland, 2008). Second, we also obtain mixed results regarding the dimension management of employees. For hierarchy culture, as expected, this dimension has a negative effect on innovation as opposed to imitation orientation. This result provides evidence that fostering security of employment, conformity, predictability and stability in relationships within the employees is better for followers than for pioneers. However, the results for the management of employees that characterizes adhocracy culture do not support the assumption that is generally found in the literature. We found that it has a negative effect on innovation compared with imitation. A possible explanation for these results is that adhocracy culture does not foster team working and this variable is considered to be a key element for enhancing innovation (Arad *et al.*, 1997; Jamrog *et al.*, 2006; Martins and Terblanche, 2003; McLean, 2005). Additional analyses are showed that when management of employees emphasizes team working, innovation increases in comparison with imitation. Finally, our findings are consistent with the previous literature regarding the last two dimensions of both adhocracy and hierarchy cultures: organization glue and criteria of success.

The organization glue dimension refers to the employees' shared values. Our findings show that when these values are commitment to innovation and change, this dimension has a positive effect on innovation compared with imitation. On the other hand, when these values are hierarchy and respect for formal rules and policies, the organization glue dimension has a negative effect on innovation compared with imitation.

Similarly, when the firm's criteria for success is having the most original products and being a product leader and an innovator, this dimension is positively associated

with an innovation rather than imitation orientation while this dimension is negatively related to innovation orientation when it is defined as efficiency, dependable delivery, smooth scheduling and low-cost production.

Taking this findings into account it seems that formal rules and procedures may foster innovation as opposed to imitation when they are balanced by other dominant characteristics but formalization should not become the employees' main shared values because it inhibits innovation. In summary, the main contributions of this paper are, first, to examine empirically the relationship between organizational culture and the innovation strategy of the firm. The literature highlights the role of organizational culture in innovation but the empirical studies on this issue are very scarce. Second, this paper provides empirical evidence that organizational culture affects the innovation strategy of the firm – innovation or imitation. In particular, our findings show that adhocracy culture fits better to an innovation orientation while hierarchy cultures are preferable for an imitation orientation. Third, this paper shows that the relationship between culture and innovation/imitation is more complex than the literature suggests. Although most of the dimensions of those cultures affect the innovation strategy of the firm as expected, there are some aspects of these cultures (management of employees in adhocracy and organizational dominant characteristics) whose effects are the opposite of that anticipated in the literature assumptions.

These results have implications for practitioners. In order to be successful in the implementation of their innovation strategy (innovation or imitation) they should pay attention to organizational cultures. In particular, if they adopt an innovation strategy they should foster the cultural values of adhocracy, mainly commitment to innovation, being the product innovation leader and developing a dynamic and entrepreneurial place where people take risks and, at the same time, as creating an environment where team working is highlighted. In contrast with this, if the firm decides to be a follower, in general hierarchy culture is preferable. That is, company should emphasize efficiency, dependable delivery, low-cost production, formal rules and policies, hierarchy and control. The only elements of a hierarchy culture that they should avoid are employees' conformity, predictability and stability in relationships.

In spite of the contributions and implications of this paper, its results should not be interpreted without taking into account the limitations of the empirical study. First, this study adopts a cross-sectional design. Thus interpretation of causality between the variables should be treated with caution. Second, we have evaluated only four of the six features of the competing value model in a way that has been done before by many studies that are reported in the literature. However, that has reduced the number of factors or traits that define an organization's culture (e.g. Deshpandé *et al.*, 1993; Lau and Ngo, 2004; Obenchain and Johnson, 2004; Obenchain, 2002). Although this restriction to fewer features might introduce some bias, the most important dimensions are included. Finally, the data for the study were collected from one source. Most of quantitative studies on organizational culture use of single informants and, in general, they focus on CEOs (Al-Khalifa and Aspinwall, 2000; Lau and Ngo, 2004; McDermott and Stock, 2001; Stock *et al.*, 2007). However, the use of multiple informants would enhance the validity of the research findings.

Future studies should address these limitations. For instance, in order to examine the causality of these relationships, future research should use longitudinal studies. Multiple informants would also enhance the validity of the research findings.

In addition, future research should examine the relationship between formalization and the innovation strategy in more depth and try to identify how to balance formalization with entrepreneurial and risk-taking values. Similarly, it would be interesting to identify which values relating to management of employees should be enhanced. We believe that future research should study the moderator effect of some variables in the culture-innovation orientation relationship. Such mediator variables might include organizational resources and structure (Matsuno *et al.*, 2002; Shamsie *et al.*, 2004). Furthermore, environmental and technological turbulence could affect the chosen strategic position (Manu, 1992; Miller and Friesen, 1982; Zhou, 2006). Thus, more research is needed on how the environmental conditions, affect the choice of innovation strategy by a company (Lieberman and Montgomery, 1998; Zhou, 2006). Finally, it would be valuable to analyze the effect on performance of adopting an innovative or imitative orientation depending on the level of turbulence in the environment.

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Appendix. Items included in the organizational culture measures

Organizational culture

Organization-dominant characteristics

- (1) Personal place – it is like an extended family. People seem to share a lot of themselves.
- (2) Dynamic and entrepreneurial place – people are willing to stick their necks out and take risks.

- (3) Results-oriented – a major concern is with getting the job done. People are very competitive and achievement oriented.
- (4) Controlled and structured place – formal procedures generally govern what people do.

Management of employees

- (1) Teamwork, consensus, and participation.
- (2) Individual risk-taking, innovation, freedom, and uniqueness.
- (3) Hard-driving competitiveness, high demands, and achievement.
- (4) Security of employment, conformity, predictability, and stability in relationships.

Organization glue

- (1) Loyalty, organizational commitment, mutual trust and teamwork.
- (2) Commitment to innovation and an emphasis on being on the cutting edge.
- (3) Aggressiveness, winning in the marketplace, and goal accomplishment.
- (4) Formal rules and policies-maintenance, and hierarchy importance.

Criteria of success

- (1) The development of human resources, teamwork, employee commitment, and concern for people.
- (2) Having the most unique or newest products. It is a product leader and innovator.
- (3) Winning in the marketplace and outpacing the competition-competitive market leadership is the key.
- (4) Efficient-dependable delivery, smooth scheduling, and low-cost production are critical.

Note: Scores from items 2) were added to measure adhocracy culture. Scores from items 4) were added to measure hierarchy culture.

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