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Managers' risk taking propensity and innovation in organizations: the mediating influence of employees' perceived risk taking climate

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Abstract

Disentangling the effects of risk taking on innovation performance, the present study separated, both theoretically and empirically, the effects of the managers' risk-taking propensity and the employees' perceived risk-taking climate. Specifically, we hypothesize and test a model where the impact of the manager's risk-taking propensity on innovation performance is mediated by its effect over the employees' perceived risk-taking climate. Structural equation modeling was used to test the research hypotheses on a data set of 182 firms from the Spanish and Italian ceramic tile industry. As expected, results indicated that employees' perceived risk-taking climate plays a significant role in determining the effects of managerial risk taking on innovation performance.

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**MANAGERS' RISK TAKING PROPENSITY AND INNOVATION IN
ORGANIZATIONS: THE MEDIATING INFLUENCE OF EMPLOYEES'
PERCEIVED RISK TAKING CLIMATE**

Keywords

Innovation performance, managers' risk taking, organizational climate, perceived risk taking, signaling theory, social cognitive theory

INTRODUCTION

The ability of firms to innovate is a primary factor in gaining and sustaining competitive advantage (Nelson & Winter, 1985). Hence, a widely supported idea is that innovative behaviors should be highly encouraged across all levels of the organization, given that such behaviors are likely to exert a positive influence in organizational effectiveness (Amabile, Barsade, Mueller, & Staw, 2005; Woodman, Sawyer, & Griffin, 1993). The focal point of our research is on the relationship between risk taking and innovation performance, from both a managerial and an employee perspective. The relationship between risk-taking and innovation performance is particularly fruitful. Substantial research from diverse fields have suggested a close link between risk-taking and innovative behaviors in organizational settings (March & Shapira, 1987). Risk-taking and innovation are intertwined due to the nature of creative behaviors in organizations.

From a managerial perspective, the link between risk-taking and innovation performance has been examined through a wide range of approaches, such as entrepreneurial orientation and leadership related literatures (Covin & Slevin, 1986; Wu, Levitas & Priem,

2005; Ling, Simsek, Lubatkin & Veiga ., 2008). Risk taking involves the engagement of significant resources to activities that have significant possibilities of failure, such as incurring heavy debt or making large resource commitments, with the objective of grasping potential high benefits (Lumpkin & Dess, 1996; Alegre & Chiva, 2010; Fernández-Mesa, Alegre-Vidal & Chiva-Gómez, 2012). Eventually, managers vary in their individual propensities to take risks. However, there is evidence showing the relevance of prone risk manager's in the attainment of innovation results (e.g. Ling et al., 2008). The achievement of innovation is based on a great deal of uncertainty, thus bold decisions and actions are many times a necessary condition. In this sense, often, managers need to embark themselves on this type of risky decisions in order to achieve innovation outcomes. In March (1987) words, "risk taking is valued, treated as essential to innovation and success".

The literature on creativity (e.g.: Amabile, Conti, Coon, Lazenby, & Herron, 1996) provides a different view of the relation between risk-taking and innovation by focusing on how employees engage in innovative activities. A fundamental idea is that creative behaviors are about challenging the existing status quo of given aspect of the organization. From an employee' perspective, the consequences of such challenge are uncertain. In fact, those employees showing innovative behaviors may face negative consequences if they fail (Zhou & George, 2001). For instance, Janssen (2003) demonstrated that innovative employees are likely to fall into conflict with co-workers. The argument is that a worker promoting new ideas is challenging the established courses of action of their co-workers. Therefore, resistance in the form of work conflict will be likely to arise. To put it differently, those employees deciding to behave innovatively are implicitly assuming a certain amount of risk derived from the uncertainty of their outcomes and the potential reticence from their colleagues.

Although work from both views has significantly advanced in the understanding of the nature of the link between risk taking and innovation performance, little empirical research has analyzed this link through a combined perspective. We believe that much more can be learned if the causes and effects of risk taking over innovation performance are explored simultaneously at different levels of the organization. We argue that managers' risk taking behavior not only exerts a direct effect over innovation performance. Rather, the organizational risk-taking climate of the organization will be benefited due to the positive signaling effects derived from managers' risky behaviors.

CONCEPTUAL BACKGROUND

Innovation Performance

Innovation is central in establishing and sustaining competitive advantage of firms (Nelson, 1991; Teece, Pisano & Shuen, 1997). The evolution of an increasingly complex environment has placed innovation as an indispensable option when planning to increase firms' performance and assure its growth and ultimate survival (Damanpour, 1991; Daellenbach, McCarthy & Schoenecker, 1999). Innovation can be defined as the successful implementation of new ideas (Myers & Marquis, 1969; Amabile et al., 1996). This interpretation of innovation includes novelty and use as two conditions that must be fulfilled. In this sense, innovation not only requires of new ways of solving problems but also involves use or achievement of commercial success.

A widely known classification of innovation distinguishes between product and process innovations (OECD, 2005; Martínez-Ros & Labeaga, 2009). Product innovation is understood as the product or service introduced to meet the needs of the market or of an external user, and process innovation is understood as a new element introduced into production operations or functions (Damanpour & Gopalakrishnan, 2001). However, both

types of innovations are closely related and, even though firms can be more dedicated to innovate in products, process innovations may be necessary for the successful implementation of product innovations (Utterback & Abernathy, 1975; Martínez-Ros & Labeaga, 2009).

Innovation has resulted to be a very complex process presenting high failure rates (Stevens & Burley, 1997; Wu et al., 2005). However, despite the difficulty in attaining innovation, it is definitely one of the driving forces behind organizational growth and thus, the study of its determinants is of vital importance.

Managers' Risk Taking Propensity

The determinants of innovation have been extensively researched and include from exogenous factors, such as the firm's external environment, to more malleable aspects such as organizational culture, structure and strategy (Papadakis, Lioukas & Chambers, 1998; Jansen, Van den Bosch & Volverda, 2006; Vega-Jurado, Gutiérrez-Gracia & Fernández-de-Lucio, 2008). In particular, leaders have been repeatedly recognized as strategic decision makers including among other domains, their critical role in recognizing opportunities and making decisions that affect innovation processes (Elenkov, Judge & Wright, 2005; Aleviev, Jansen, Van den Bosch & Volverda, 2010; Vaccaro, Jansen, Van den Bosch & Volverda, 2010). In this kind of decisions, managers confront the uncertainty intrinsic in innovation activities. Innovation needs the investment of time, effort and resources, such as, increases in R&D expenses or the allocation of management attention, even though the distribution of the returns is unknown (Wu et al., 2005; Ling et al., 2008). This uncertainty and the significant possibilities of failure often lead to risk adverse behaviors and under-investments in innovation (Finkelstein, 1992). Nevertheless, the expectancy of potential high returns drives seldom managers to decide themselves for risky solutions, focusing on the potential benefits of innovation instead of the potential losses (Sitkin & Weingardt, 1995, Ling et al., 2008).

Several streams of research propose that manager's risk-taking propensity can make a difference in defining the propensity of the firm to innovate. The entrepreneurial orientation literature, for instance, has conceptualized risk-taking as one of the dimensions integrating the strategic posture of the firm, that is, the extent to which top managers are inclined to take business related risks (Covin & Slevin, 1986). Generally, scholars in this tradition have examined how entrepreneurial orientation heightens performance (Zahra & Covin, 1995; Madsen, 2007), which can be considered a very close output of innovation results (Fernández-Mesa et al., 2012).

Anchored in strategic management research, scholars using the upper echelons perspective have also studied the risk taking propensity of managers and top managers' teams through characteristics such as tenure, age or diversity and their effect on innovation performance (Bantel and Jackson, 1989; Wu et al., 2005; Liu et al., 2012). Moreover, studies based on leadership literature have assessed in a more direct manner how the propensity of top management teams towards risk-taking has an influence on performance (Papadakis et al., 1998; Peterson, Smith, Martorana & Owens, 2003) and more specifically on innovative processes and outcomes (Ling et al., 2008). In general, results confirm that managers biased towards risk-taking behaviors are more likely to obtain better innovation results.

Although managers' risk taking propensity appears as a pivotal role in explaining innovation performance in organizations, the inner mechanism through which this is ultimately linked to the organization' innovative performance is obscured in the literature. Informal factors in the organization may play a significant function in approaching this question.

Employees' perceived risk-taking climate

Although there are a variety of ways to approach the different contextual features that organizations may have, researchers have often used the heading of organizational climate to assess those social features of the workplace that facilitate or inhibit certain behaviors (Schneider, 1975; Schneider, Smith, & Sipe, 2000). The organizational climate is a multidimensional construct that deals with a wide range of organizational realities (James & McIntyre, 1996). According to Denison (1996), the organizational climate is concerned with those aspects of the social environment that are consciously perceived by the organizational members.

The concept of organizational climate has become prominent among management scholars, and it is usually deconstructed into specific dimensions (Schneider & Reichers, 1983), depending on the particular phenomena under study. For instance, climate scholars have developed a construct to measure a climate for justice (Naumann & Bennett, 2000), creativity (Gilson & Shalley, 2004), innovation (Anderson & West, 1998; Pirola - Merlo & Mann, 2004), diversity (McKay, Avery, & Morris, 2008), or ethics (Ambrose, Arnaud, & Schminke, 2007), among other. It is worth to notice that many of these specific climates can be found simultaneously in the organization (Kuenzi & Schminke, 2009), since they are measuring different realities of the organizational environment.

Employees conceive the climate of the organization as a source of specific cues about how to behave. Those cues are used as guidelines to behave in the organization (Ashkanasy et al., 2000) and therefore, help to exhibit or inhibit certain behaviors in the organizational setting. For instance, empirical studies have reflected that those employees perceiving a climate characterized by high fairness among employees will tend to behave in a fairly manner (Ehrhart 2004). In a similar vein, innovation and creativity scholars have linked some facets of the organizational climate to innovative behaviors and innovation performance. For instance, (Gilson & Shalley, 2004) discovered that those team members that were more

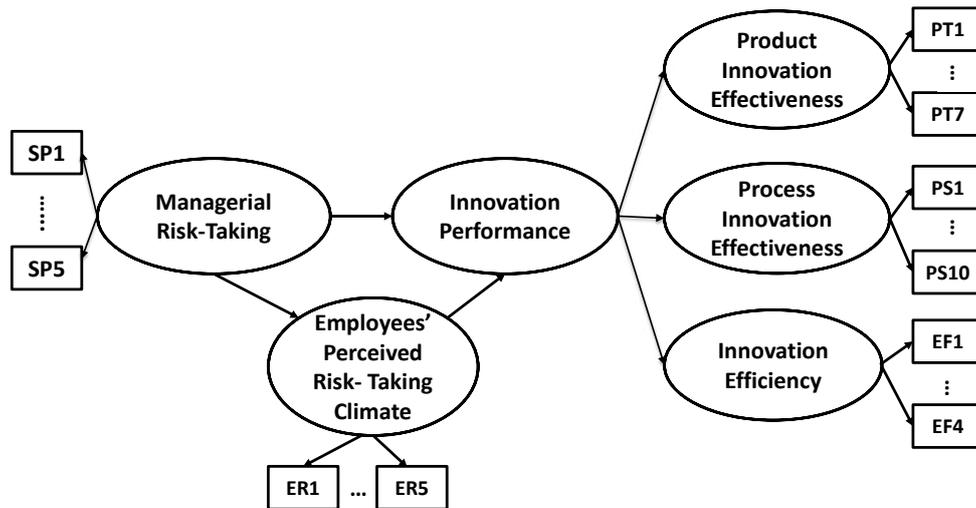
engaged in creative processes reported that their team climate was more supportive of creativity. Similarly, (King, De Chermont, M. West, Dawson, & Hebl, 2007) found that a climate for innovation was positively linked to organizational performance.

A particular facet of the organizational climate that is likely to influence employees' innovative performance is the perceived risk-taking climate. Employees fear to fail (Zhou & George, 2001), and innovating in an organizational setting may be viewed as a risky behavior, as it is a challenge to the status quo. Risk taking means uncertainty about the potential outcomes of one's decision (Sitkin & Pablo, 1992) and may elicit negative reactions from colleagues and supervisors (Frese & Fay, 2001) Therefore, it is to be hoped that many employees are reluctant to engage in risk taking behaviors. We propose that this barrier may be overcome if employees perceive that the climate of the organization supports risk taking and innovation. In this sense, managers with a high propensity towards risk-taking may enable the emergence of a risk-taking climate among employees, which can encourage them to contribute to the organizations' innovation performance.

HYPOTHESES

Based on the discussion in the preceding section, we propose a conceptual model shown in Figure 1. The primary purpose of the model is to simultaneously integrate the effects of management risk-taking propensity and perceived risk-taking climate over innovation performance. Specifically, the main tenet is that managers' risk-taking propensity will better explain innovation performance if a mediating effect over the perceived risk-taking climate is considered. Managers' risk-taking propensity may not only exert a direct influence over innovation performance, but also an effect in creating and maintaining a particular facet of the organizational climate that helps employees to cope with the associated risks of engaging in innovative behaviors.

Figure 1: Theoretical Model



Managers' Risk-Taking Propensity and Employees' Perceived Risk-Taking Climate

There has been a considerable collection of studies emphasizing the critical role of managers in shaping particular facets of the organizational climate (Grojean, Resick, Dickson, & Smith, 2004). The actions of the managers regarding risk-taking are likely to have a considerable influence over the perceived risk-taking climate of the organization. In this section we propose a series of mechanisms by which leaders' risk-taking propensity may influence the shared perception of risk taking in the organization and therefore, the risk-taking climate.

First, organizational behavior research indicates that managers' behaviors are a powerful communication mechanism that conveys the assumptions of the climate of the organization (Ashkanasy et al., 2000; Grojean et al., 2004). Managers' behaviors are role models of appropriate behaviors in particular situations. According to social cognitive theory (Bandura, 1986), individuals have the capacity to learn vicariously. Vicarious learning refers to the process of learning by observing the behavior of others and the consequences of it (Bandura, 2001) For instance, House & Shamir (1993) suggest that vicarious learning is an

important mechanisms through which the values of the organization are transmitted from the managers to the employees of the organization. We extend this rationale to argue that those managers more prone to take risks in their organizational decisions will shape the risk-taking climate of the organization. As a consequence, employees will perceive the climate as more tolerant with risk taking.

Another transmitting mechanism through which managers' risk-taking propensity may influence the perceived risk-taking climate is anchored in signaling theory (Spence, 1973). Signaling theory refers to behaviors that convey information about ones' intentions and abilities. Management scholars have applied signaling theory and argued that managers are powerful signalers of desirable behaviors in organizations (Connelly, Certo, Ireland, & Reutzel, 2011). The main rationale behind signaling theory is information asymmetry. Employees may not have fully information about how they are expected to behave under particular situations (e.g.: taking a risky decision versus being conservative). In order to reduce such information asymmetry, managers may consciously decide to emit signals to observers. In the particular case of risk-taking, managers' risk taking propensity may be a powerful signal to stress the importance of risk taking behaviors among employees. Signal receivers (here, employees), will receive the signal and use it to make more informed decisions (Cohen & Dean, 2005). This rationale may be extended to the risk-taking perception of organizational employees. Taken together, the above developed arguments allow us to state that:

Hypothesis 1: Managerial risk-taking propensity is positively related to employees' perceived risk-taking climate.

Employees' perceived risk-taking climate and innovation performance

Research on creativity and innovation indicates that creative efforts require a substantial investment of time and energy on the part of the individual (Redmond, Mumford, & Teach, 1993). The ultimate decision to perform innovative behaviors is coined to the individual, and the willingness and motivation to do so may be influenced by a number of organizational characteristics. According to (Yuan & Woodman, 2010), innovative behavior is defined as “as an employee’s intentional introduction or application of new ideas, products, processes, and procedures to his or her work role, work unit, or organization” (2010 : 324). Employees deciding to search and apply new technologies for their daily work, or suggesting new ways to achieve objectives in their organization are examples of such behaviors. Those types of behaviors are likely to exert a positive effect on the organizations’ overall innovation performance.

However, innovative behaviors are closely linked to risk taking. Engaging in an innovative behavior require to feel comfortable with risk taking or at least, to tolerate a certain amount of it. Employees may lack the motivation to take risks in their organizations by a number of reasons. Engaging in innovative acts in the workplace brings benefits but also costs (Janssen, 2003). Given that employees guide their acts according to the expected consequences of their behaviors (Vroom, 1964), the perceived costs of introducing a new idea or procedure may overshadow its potential benefits. Among those costs, challenging the “status quo” of the organization is a prominent one. Implementing or suggesting a novel procedure or idea means that the old ones are challenged. Organizations are, however, “a stabilizing force” (Klein & Knight, 2005), and organizational norms and routines foster maintenance of the status quo. Innovative employees may encounter barriers to their new ideas from their colleagues when challenging those norms. In fact, one major reason people do not engage in innovative behaviors is to avoid conflict with their colleagues (Janssen, 2003).

A contextual factor that may help to overcome these potential costs of engaging in innovation performance is a favorable organizational climate towards risk-taking (James & McIntyre, 1996). The climate of the organization signals expectations for desirable behaviors and help to predict the returns of diverse behaviors. If employees perceive that a certain behavior is legitimated among the colleagues; their willingness to perform that particular behavior will be increased. For the case of innovation performance, it is reasonable to expect that an organizational climate supporting risk-taking will enhance the willingness of employees to engage in innovative behaviors (Ekvall, 1996). The underlying mechanism is that an organizational climate supporting risk taking serves to legitimate innovative behaviors. Organizational members will more likely understand that being innovative is a desirable behavior in the organization, and will feel more psychologically saved to perform trial and error attempts (Yuan & Woodman, 2010). It is reasonable to expect that employees perceiving a favorable risk-taking climate will enable the integration of risk-taking behaviors and hence, the overall innovation performance of the organization will be benefited. To sum up, we propose that those organizations with higher levels of risk-taking climate will show higher levels of innovation performance, compared to those organizations with lower levels of perceived risk-taking climate.

Hypothesis 2: There is a positive relationship between employees' perceived risk-taking climate and innovation performance.

Manager's risk-taking propensity and innovation performance: a case for partial mediation

Scholars have extensively assumed that top manager's strategic purposes are synonymous from those at the organizational level and that top manager's personalities and behaviors can have a direct influence on organizational outcomes. However, despite the

relevance of these leaders, real change emerges at lower levels within the organizational structure (Jelinek, 2003). In this sense learning and cognitive theories state that senior executives with strong convictions towards innovation contributions are not enough to generate the necessary organizational change driving novelty and enabling innovation. For this change to occur, a critical mass of shared belief must be generated (Sidhu, Commandeur & Volberda, 2007). Specifically, risk-taking propensity should be a relevant characteristic in manager's personal schemata in order to induce an innovative logic but it will not be enough. The organizational climate it is susceptible to managers' influences (Peterson et al., 2003) achieving that greater managers acceptance of risk cascades down the organizational hierarchy in order to further enhance the firm's innovative proclivity (Ling et al., 2008).

Hence, we argue that managers have the power of shaping climate towards risk-taking and once achieved, innovation has more chances to emerge. In this sense, we enrich prior studies analyzing the direct link between managers' risk-taking and innovation by arguing that innovation is also a function of employees' perceived risk-taking climate. In particular, we argue that managers' risk-taking will not only exert a direct effect on innovation performance but it will also impact innovation through employees' perceived risk-taking climate. In this sense, risk-taking climate will mediate the relationship between manager's risk propensity and innovation performance.

Hypothesis 3: The relationship between managerial risk-taking and innovation performance is mediated by employees' perceived risk-taking climate.

RESEARCH METHODS

Data Collection

Our research hypothesis is tested on a single industry: ceramic tiles production in Italy and Spain. Italian and Spanish ceramic tile producers have several things in common. Most

are SMEs with a maximum of 250 workers on average, and are generally geographically concentrated in industrial districts (Enright & Tenti, 1990). The Italian ceramic tile industrial district is located in Sassuolo (Northern Italy) and the Spanish district is in Castellón (Eastern Spain). Aggregate production on these two districts is similar. Several studies have analyzed innovation in the ceramic tile industry and find enamels and design to be the most important areas of product improvement (Meyer-Stamer, Maggi & Seibel, 2004; Hervás-Oliver, Jackson & Tomlinson, 2011).

Our focus on the ceramic tile industry reduces the range of extraneous variations in the data which could influence the constructs of interest. Analyzing a single sector has the advantage that it avoids a problem common to inter-sectoral studies, of technological and economic diversity of products (Coombs, Narandren & Richards, 1996; Santarelli & Piergiovanni, 1996). We acknowledge the disadvantages of this sampling in terms of limiting generalizability but believe that they are outweighed by the advantages offered by this approach. The field work was conducted in June to November 2004. Pre-testing was carried out on four technicians from ALICER, the Spanish Center for Innovation and Technology in Ceramic Industrial Design, to ensure comprehensibility of the questions in the context of the ceramic tile industry. The questionnaire used a 7-point Likert scale.

We received a total of 182 completed questionnaires, 101 from Spanish firms and 81 from Italian firms, which represents around 50% of the population under study for both the Italian and the Spanish subsamples (Chamber of Commerce of Valencia, 2004). The number of responses and the response rate can be considered satisfactory (Spector, 1992; Williams, Gavin & Hartman, 2004). To check for non-response bias, sales turnover and number of employees in respondent and non-respondent firms were compared. The comparison did not reveal any significant differences.

Measures

Managerial risk-taking. We use the dimension of risk taking of the Covin & Slevins' (1986) EO scale. This scale has been developed to reflect "*the organizational processes, methods and styles that firms use to act entrepreneurially*" (Lumpkin & Dess, 1996, p. 139). Risk taking is one of the original three dimensions forming the EO scale, together with innovativeness and proactiveness. Specifically, risk taking involves taking bold actions by venturing into the unknown, borrowing heavily, and/or committing significant resources to ventures in uncertain environments. Although all three dimensions are highly related, empirical evidence shows that each dimension is conceptually different and partly independent from the other dimensions (Lyon, Lumpkin & Dess, 2000; Naldi, Nordqvist, Sjöberg, & Wiklund, 2007). These items were applied using a 7-point Likert scale (see appendix).

To measure *employees' perceived risk-taking climate* we use the items proposed by the literature using a 7 point Likert scale. Isaksen et al. (1999) proposed different items to measure employees' risk-taking climate. On the other hand, Amabile et al. (1996) also measure how to reinforce creativity through employees risk taking. Our proposed scale is presented in an annex.

Innovation performance was measured using the scale provided in the OECD's (2005) Oslo Manual for the assessment of the economic objectives of innovation. This scale was proposed by the OECD in order to achieve greater homogeneity and comparability among innovation studies. We asked the innovation performance in compared with competitors with regard to the following items (see appendix) with a 7 point Likert scale. We operationalized innovation performance as a second-order factor construction, integrated by three different dimensions: product innovation efficacy, process innovation efficacy and innovation projects

efficiency. Product and process innovation efficacy reflects the degree of success of an innovation. Innovation projects efficiency reflects the effort carried out achieve that degree of success. These dimensions have been widely discussed in innovation research (Brown & Eisenhardt 1995; Chiesa, Coughlan & Voss, 1996).

RESULTS

Psychometric Properties

The psychometric properties of the measurement scales were assessed in accordance with accepted practice (Gerbing & Anderson 1988; Tippins & Sohi 2003), including content validity, reliability, discriminant validity, convergent validity, and scale dimensionality. Table 1 presents the factor correlations, means, and standard deviations.

Content validity was established through a review of the literature and interviews with ceramic tile industry experts (four ALICER technicians). We computed the coefficient alpha and composite reliability indicator to assess scale reliability (Fornell & Larker 1981; Boullusar, Escrig_Tena, Roca-Puig & Beltrán-Martin, 2009). All scales achieved acceptable coefficient alphas and composite reliability indicators of at least 0.70 (Table 1).

TABLE 1. Factor correlations, means, standard deviations, Cronbach's alphas and Composite Reliabilities

	Mean	s.d.	CR	1	2	3	4	5
1.- Employees' perceived risk taking climate	4.84	1.13	0.83	(0.83)				
2.- Managerial risk taking	3.89	1.31	0.74	0.313**	(0.74)			
3.- Product innovaton effectiveness	5.07	1.11	0.91	0.471**	0.485**	(0.92)		
4.- Process innovation effectiveness	4.9	1.12	0.94	0.462**	0.366**	0.846**	(0.94)	
5.- Process innovation efficiency	4.69	1.22	0.92	0.563**	0.489**	0.797**	0.782**	(0.92)

** Statistically significant correlation coefficient (p<0.01).

Cronbach's alpha are shown on the diagonal. Composite reliabilities are shown in the CR column

To calculate the correlation coefficients, we worked with the means of the items that make up each dimension.

Discriminant validity was assessed through confirmatory factor analysis by comparing the χ^2 differences between a constrained confirmatory factor model and an interfactor correlation set at 1 (indicating they are the same construct) and an unconstrained model with an interfactor correlation set free. All χ^2 differences were significant, providing evidence of discriminant validity (Anderson & Gerbing 1988; Gatignon, Tushman, Smith & Anderson, 2002; Tippins & Sohi 2003). Confirmatory factor analysis was used also to establish convergent validity by confirming that all scale items loaded significantly on their construct factors (Anderson & Gerbing 1988). Convergent validity was also confirmed by comparing the χ^2 differences between a constrained confirmatory factor model with an interfactor correlation set at 0 (indicating no relationship between the two constructs) and an unconstrained model with an interfactor correlation set free. All χ^2 differences were significant, providing evidence of convergent validity (Gatignon et al. 2002). We checked the dimensionality of the constructs through the loadings of the measurement items on first-order factors, and the loadings of the first-order factors on second-order factors. All loadings were above 0.40 and significant at $p < 0.001$. No cross-loadings emerged.

Before testing our hypotheses, we assessed the extent of common method variance by conducting a Harman's single-factor test (Podsakoff & Organ 1986; Podsakoff, MacKenzie, Lee & Podsakoff, 2003; Bou-Llusar et al., 2009). Common method variance is a problem that can arise when the dependent and independent variables are collected from a single informant. In our study, we used two different key informants to minimize this problem.

Test of the Research Hypotheses

We tested for the presence of a mediating effect by performing competing model analysis. The first model (direct effect) examines the direct relationship between organizational learning capability and product innovation performance. Table 2 shows the

results of the competing model analyses. The χ^2 statistic for each model is significant, and the other relevant indices suggest a good overall fit (Tippins & Sohi, 2003).

Figure 2: Direct Model

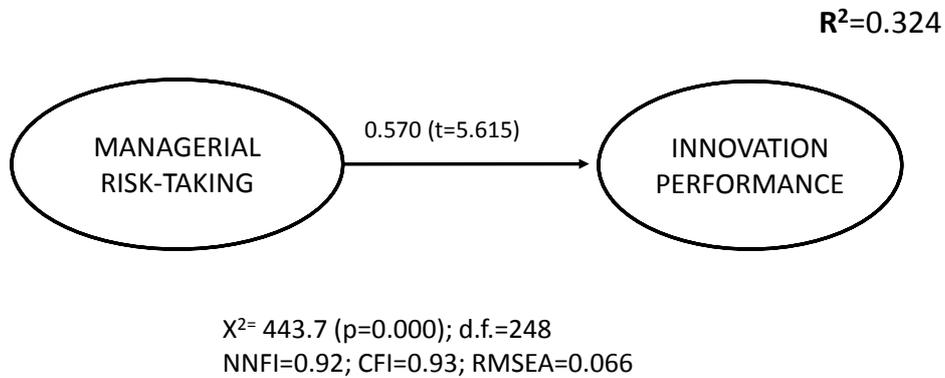
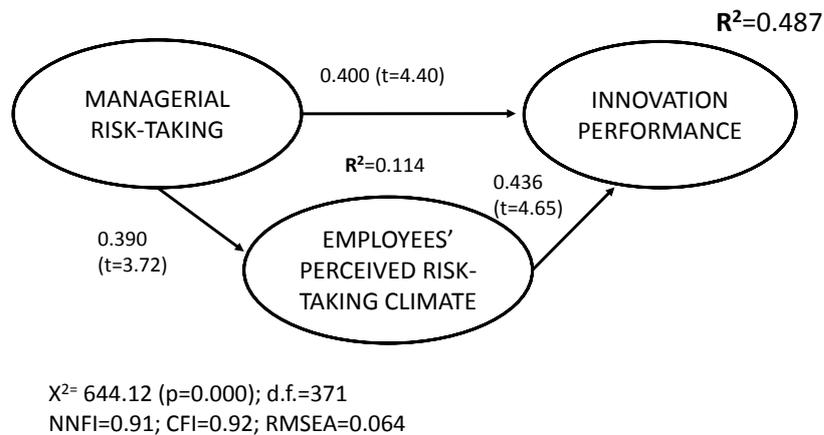


Figure 3: Mediated Model



First, the direct effect model was tested and found to be satisfactory. There is evidence of a positive link between managerial risk-taking propensity and innovation performance. Second, the inclusion of employees' perceived risk-taking climate in the analysis helps to explain this positive link: employees' perceived risk-taking climate acts as a mediating variable that boosts the positive effect (Grewal & Slotegraaf, 2007). The mediating effect of it on the relationship between managerial risk-taking propensity and innovation performance is demonstrated by the following sequence, suggested by Tippins & Sohi (2003): (1) the partial

mediation model explains more of the variance of the dependent variable than the direct model ($R^2=0,487$ vs. $R^2=0,324$); (2) there is a positive relationship between managerial risk-taking and employees' perceived risk-taking climate; (3) there is a positive relationship between employees' perceived risk-taking climate and innovation performance; and (4) the significant relationship between managerial risk-taking and innovation performance indicated in the direct effect model in the partial mediation model. Statements (1)–(4) provide compelling evidence of a clear mediating effect of employees' perceived risk-taking climate on the relationship between managerial risk-taking and innovation performance. Thus, the partial mediation model represents a significant contribution to our understanding of the positive influence—supported by the theory and previous empirical research—of managerial risk-taking on innovation performance. The positive impact of managerial risk-taking propensity on innovation performance is mediated by the firm's employees' perceived risk-taking climate. These results provide support for our research hypothesis.

DISCUSSION

The attitude of managers towards risk taking has received considerable attention within the literature. In part the significance of risk taking is due to its noteworthy effects on innovation performance. Generally, managers characterized by risk taking behavior do not constrain their actions by the unpredictable consequences of innovation decisions. When deciding whether to allocate resources or to direct processes towards the development of new products and processes, risk taking prone managers are more willing to do so. This idea chimes with prior empirical studies analyzing the relationship between managerial risk taking and innovative results (e.g. Ling et al., 2008).

However, these studies have focused on the direct link between managerial risk and innovation, even though there are reasons to believe that they do not fully capture the

complexness involved in this relationship. Studies anchored in organizational climate literature have suggested that organizations where risk taking is encouraged can influence employees' behaviors towards innovation, thus, benefiting the organizations overall innovation performance (Gilson & Shalley, 2004; Yuan & Woodman, 2010). Thus, this paper takes this literature into consideration and ultimately shows the relationship between managers' risk-taking propensity, organizational climate and innovation.

First, the present research provides empirical evidence that managerial risk taking is positively related to employee's perceived risk taking climate. In the development of our theoretical framework we considered social cognitive and signaling theory as two theories that explain the mechanisms through which risk taking can be transmitted from upper to lower echelons. While the former, expects that individuals learn vicariously, the latter assumes information asymmetry and expects managers to consciously emit signals to employees. Though based in distinct assumptions, both theories support the relevance of manager's role in generating a climate where risk-taking is supported.

Second, this study also provides empirical evidence that employee's perceived risk taking climate enhances innovation performance. Scholars dealing with organizational climate have paid attention to the distinct dimensions integrating this concept, such as innovation climate. For instance, King et al. (2007) showed that a climate for innovation exerted a positive effect on organizational performance. However, even though some studies have theoretically reasoned that risk taking climate can affect innovative behavior and outcomes (Ekvall, 1996; Yuan & Woodman, 2010) empirical tests analyzing the relationship between risk-taking climate and innovation performance are surprisingly still lacking.

Third, we show that manager's risk taking propensity has an indirect positive effect on firm's innovation performance, which is mediated by risk-taking climate. Hence, risk-taking

climate plays a pivotal role in ultimately explaining the effect of manager's tendency towards risk on innovation outputs. Companies counting with managers that are able to translate their risk taking propensity towards the rest of employees within the organization are able to perform better in contrast to those firms that fail.

In brief, this study shows that the role of employees' risk taking climate is determinant in mediating the relationship of manager's risk taking and innovation performance. On the one hand, the results of this study contribute to upper echelon and other leadership behavior theories by demonstrating that the effect of manager's risk taking on innovation is not direct but it is rather mediated by a relevant contextual factor: risk-taking climate. On the other hand, this study contributes to the literature of organizational climate. In this case, we empirically validate that risk-taking climate has a significant effect on innovation performance.

Managerial implications

This study has implications for practitioners. Risk has been continuously described as an essential ingredient if willing to achieve innovation. However, the acknowledgement by managers of risk relevance is not sufficient to achieve organizational innovation. Managers should be able to translate their proactiveness towards risk to other employees creating a creative and biased climate with potential to generate innovative behaviors. In this sense, this paper underlines the relevance of supporting risk-taking climates and its effects on innovation performance.

Moreover, this investigation is particularly relevant for solving the problem many organizations face in relation to manager's turnover. Organizations relying in key managers for relevant decisions happen to enter in uncertainty in the case of their departure. For instance, consider a manager characterized for its affinity towards decisions involving high

risks. If this input is significant for the pursuit of the organizations innovation results it would be a great lose if the manager exits the firm. That is why it would be in the interest of the company to arouse risk taking behavior among the rest of the. In particular, firms in the ceramic tile industry are many times family owned, being especially vulnerable to this situation (Fernández-Mesa et al. 2012).

Limitations and further research

Limitations need to be necessarily taken into account. One of the study's main limitations makes reference to the nature of the data, collected in one moment in time. This type of research, understood as cross-sectional, presents inconveniencias when data changes over time. However, our aim is perform future longitudinal studies in order to evaluate possible variations in time and solve endogeneity problems.

Another important limitation is that the study has been pursued within the boundaries of an industry: the ceramic tile industry. This means that the extrapolation of results to other sectors should be performed with extreme foresight. Additional research in other industries will be definitely advisable. Moreover, the ceramic tile industry is characterized by mostly integrating small and medium firms. In this case, managers have a major degree of discretion over innovation outcomes. However, future research could focus on large enterprises, in which manager's influence on innovation is usually lower and the creation of a risk climate could have greater implications.

The use of self-reported innovation performance can also be considered as a limitation (Venkatraman, 1989). It would be very interesting to collect additional objective dependent measures to avoid possible biases and add robustness to our results. Moreover, pursuing qualitative research could also improve our research by providing a deeper understanding of the object of study (Chiva & Alegre, 2009).

Lastly, it would be interesting to open further the black box. Decentralization in decision making has been advanced as a managerial practice that empowers employees and leaves them more room to reach novel and disruptive ideas entailing higher degrees of risk (Jansen et al., 2006). Also, dynamic environments have been described as pushing firms towards the generation of innovations because of the heightened possibility of product obsolescence (Sidhu, Volberda & Commandeur, 2004). Hence, further research could benefit from analyzing in depth the contingent effect of these practices in the relationship between manager's risk taking propensity, risk-taking climate and innovation performance.

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ANNEX

QUESTIONNAIRE

Managerial risk-taking

Please rate your firm's strategic posture scale. (Covin & Slevin, 1989)

Totally agree with the left column	1	2	3	4	5	6	Totally agree with the right column
SP1. A strong proclivity for low-risk projects (with normal and certain rates of return)	1-2-3-4-5-6-7						A strong proclivity for high-risk projects (with chances of very high returns)
In general, the top managers of my firm believe that...							
SP2. Owing to the nature of the environment, it is best to explore it gradually via timid incremental behavior	1-2-3-4-5-6-7						Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
When confronted with decision-making situations involving uncertainty, my firm...							
SP3. Typically adopts a cautious, "wait-and-see" posture in order to minimize the probability of making costly decisions	1-2-3-4-5-6-7						Typically adopts a bold, aggressive posture in order to maximize the probability of exploiting potential opportunities

Employees' perceived risk-taking climate

<i>Could you please assess the importance of the following items in your organization?</i>	
Item	Literature source
ER1. Initiative often receives a favorable response here, so people feel encouraged to generate new ideas.	Isaaksen, Lauer and Ekvall (1999) and Amabile, Conti, Coon, Lazenby & Herron (1996)
ER2. People are encouraged to take risks in this organization.	
ER3. People here often venture into unknown territory.	
ER4. People here receive support and encouragement when presenting new ideas.	
ER5. Ideas that still have not been tested are usually presented .	

Innovation Performance Measurement Scale

Please state your firm performance compared to that of your competitors over the last three years with regard to the following items

Dimension	Item	Literature source
Product innovation effectiveness	PT1. Replacement of products being phased out	OECD (2005); Brown and Eisenhardt (1995); Chiesa et al. (1996)
	PT2. Extension of product range within main product field through new products	
	PT3. Extension of product range outside main product field	
	PT4. Development of environment-friendly products	
	PT5. Market share evolution	
	PT6. Opening of new markets abroad	
	PT7. Opening of new domestic target groups	
Process innovation effectiveness	PS1. Improvement of production flexibility	
	PS2. Reduction of production costs by cutting labor cost per unit	
	PS3. Reduction of production costs by cutting material consumption	
	PS4. Reduction of production costs by cutting energy consumption	
	PS5. Reduction of production costs by cutting rejected production rate	
	PS6. Reduction of production costs by cutting design costs	
	PS7. Reduction of production costs by cutting production cycle	
	PS8. Improvement of product quality	
	PS9. Improvement of labor conditions	
	PS10. Reduction of environmental damage	
Project innovation efficiency	EF1. Average innovation project development time	
	EF2. Average number of innovation project working hours	
	EF3. Average cost per innovation project	
	EF4. Degree of overall satisfaction with innovation project efficiency	