

**Innovation capability in achieving higher performance: perspectives of  
management and employees**

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This is a Post-print version of a publication  
published by Taylor & Francis  
in Technology Analysis and Strategic Management

**DOI:** 10.1080/09537325.2016.1259469

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**Please cite the publication as follows:**

Saunila, M. (2017). Innovation capability in achieving higher performance: perspectives of management and employees. *Technology Analysis and Strategic Management*, vol. 29, issue 8. pp. 903-916. DOI: 10.1080/09537325.2016.1259469

**This is a parallel published version of an original publication.  
This version can differ from the original published article.**

# **INNOVATION CAPABILITY IN ACHIEVING HIGHER PERFORMANCE: PERSPECTIVES OF MANAGEMENT AND EMPLOYEES**

The study clarifies the issue of whether innovation capability has a positive effect on firm performance. The effects are analyzed in the perspectives of management and employees. The study has been executed by conducting a web-based survey in Finnish SMEs. A total of 311 responses were received from a sample of 2400 randomly selected SMEs. The results show that three aspects of innovation capability, namely ideation and organizing structures, participatory leadership culture, and know-how development, are related to firm performance. The results also reveal that managers and employees have different perceptions on what aspects of innovation capability affect performance.

Keywords: innovation capability, performance, SME, innovation

## **Introduction**

The organizational capability to innovate has been of great interest to scholars who study the increasing need for innovation. In this paper, innovation is seen as an iterative process that aims at creating of new products, processes, knowledge or services by the use of new or even existing knowledge (Kusiak, 2009). Several studies have examined the relationship between innovation and firm performance (Calantone et al., 2002; Cainelli et al., 2004; Keskin, 2006; Jiménez-Jiménez and Sanz-Valle, 2011) and presented innovation as an important determinant for the success of a firm. Individual aspects of innovation capability and their relationship to firm performance have been studied, but there is no consensus between scholars on whether the relationship is positive or negative or whether it even exists.

Innovation capability has been defined in several ways in the current literature. The categories used in the area of innovation capability often adopt a certain type of innovation, instead of the overall innovation capability. Innovation capability has also been divided into radical and incremental innovation capability (Sen and Egelhoff, 2000). Also the effects of

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innovation capability on firm performance have usually been studied by using the above mentioned categories. A majority of these studies has concentrated on large companies and relationship between their innovation capability and performance. According to Rosenbusch et al. (2011) focusing only on delivering innovative offerings to the market place may not fully leverage the potential of innovation. Small and medium sized enterprises (SMEs) can benefit even more if they develop, communicate, and embrace an innovation orientation. Thus, the current measures of innovation capability do not capture the elements of innovation capability essential in the perspective of SMEs. The question that has remained unsolved is whether the various aspects of innovation capability together have an impact on firm performance in the context of SMEs.

The objective of this research is to study the relationship between organizational innovation capability and firm performance. The study contributes to the current understanding by presenting the important aspects of organizational innovation capability that have a direct connection to firm performance, and goes one step further by studying the determinants of innovation capability and their relationship with firm performance.

## **Literature review**

### ***Innovation capability***

Innovation capability has been suggested to be a multi-faceted construct. Lawson and Samson (2001), consider innovation capability as actions that can be taken to improve the success of innovation activities. Perdomo-Ortiz et al. (2006) use the term business innovation capability to describe the critical success factors of innovation processes. These critical factors can be interpreted as business innovation capability dimensions, and the capability can be measured with the factors.

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Thus, one viewpoint is to specify the organizational aspects of innovation. A body of literature has identified the common factors shared by innovative organizations and the factors that impact on the ability to manage innovation (Smith et al., 2008). According to earlier literature, these factors include for example leadership practices, employees' skills and innovativeness, processes and tools for idea management, supporting culture, external sources for information, development of individual knowledge, employees' welfare (e.g., Romijn and Albaladejo, 2002; Perdomo-Ortiz et al. 2006; Martensen et al., 2007; Smith et al., 2008; Laforet, 2011; Martínez-Román et al., 2011; Saunila and Ukko, 2014; Saunila, 2016).

In this paper, innovation capability is divided into seven dimensions, following Saunila and Ukko's (2014) study. The dimensions are participatory leadership culture, ideation and organizing structures, work climate and well-being, know-how development, regeneration, external knowledge, and individual activity. This definition was chosen because it broadly covers the important dimensions of innovation capability (see Table 1). These dimensions are proposed to exist, to some degree, within firms with high innovation capability.

### ***Innovation capability and firm performance***

According to Calantone et al. (2002), innovativeness is the most important determinant of an organization's performance. Several studies have examined the relationship between innovation and firm performance (e.g., Calantone et al., 2002; Cainelli et al., 2004; Keskin, 2006; Jiménez-Jiménez and Sanz-Valle, 2011) and support the idea that innovation is a key driver of firm success. A firm's innovativeness is positively related to a firm's economic performance in terms of higher levels of productivity and economic growth (Cainelli et al., 2004). The studies on organizational innovation and performance (e.g., Jiménez-Jiménez and Sanz-Valle, 2011) also found that innovation and organizational performance are overall

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positively correlated. Also in the context of SMEs, a firm's innovativeness improves firm performance (Keskin, 2006). On the basis of earlier literature, Armbruster et al. (2008) show that organizational innovations act as prerequisites and facilitators of an efficient use of technical product and process innovations, and therefore they are sources of competitive advantage. Organizational innovations themselves have an impact on business performance with regard to productivity, lead times, quality and flexibility (Armbruster et al., 2008). Summary of studies of the relationship between innovation and performance is presented in Table 2.

## **Hypothesis development**

### ***Participatory leadership culture and firm performance***

A participative leadership style is crucial for innovation (Wan et al., 2005). According to Zhu et al. (2005), leadership is actually one of the key driving forces for improving firm performance. This research stream suggests that leadership will result in high levels of cohesion, commitment, trust, motivation, and performance in these new organizational environments. Carmelia et al. (2010) have studied the relationship between innovation leadership (for example the encouragement of individual initiatives, provision of clear and complete performance evaluation feedback, and trust in organizational members) and performance.. This innovation leadership was found to be associated with all the three studied aspects of organizational performance – economic performance, relationship (process) performance, and product performance. The results of the study of Døjbak Haakonsson et al. (2008) confirm a complex relationship between organizational climate and leadership style and their interactive effects on performance. On the basis of earlier studies, a hypothesis can be formed as follows:

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Hypothesis 1: The higher the firm's participatory leadership culture, the greater the firm's overall performance

### ***Ideation and organizing structures and firm performance***

Bessant (2003) highlights the importance of the ability to create consistency between innovation values and behavior and the organizational context (structures, procedures etc.), as well as the ability to move innovative activity across organizational boundaries. A supportive structure also plays an important role in improving communication in the organization (Dixit and Nanda 2011). Some evidence also suggests that organizational structures can affect firm performance positively. For example Varadarajan (2009) suggests that firms should strive to nurture organizational conditions, including organizational climate, processes, policies, structure, and systems, conducive to superior performance in the realm of incremental innovations. A study of Jiménez-Jiménez and Sanz-Valle (2011) shows that age allows a company to develop organizational routines that help them to conduct their activities more efficiently, and therefore obtain better performance. Thus, the following hypothesis can be formulated:

Hypothesis 2: The higher the firm's ideation and organizing structures, the greater the firm's overall performance

### ***Work climate and wellbeing and firm performance***

Innovation is more likely in a situation where people attribute high levels of integrity, competence, reliability, loyalty and openness to others and view others as equals. Creating this environment involves having employees understand their roles, and then further developing their creative and independent sides (Dobni, 2008). Consistent with previous approaches, this study considers that the climate and wellbeing of the employees may influence the firm performance. Ozelik et al. (2008) show that leadership practices that

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facilitate a positive emotional climate in an organization have a significant effect on the firm's performance. In addition, they suggest that the emotional climate practices of a leader are related to the firm's growth. The hypothesis is as follows:

Hypothesis 3: The higher the firm's work climate and wellbeing, the greater the firm's overall performance

### ***Know-how development and firm performance***

It has been suggested that a continuous learning orientation is central for innovation (Calantone et al., 2002; Keskin, 2006). An organization committed to learning seeks a full understanding of its environment, including the customers, competitors, and emerging technology (Calantone et al. 2002). The argument that the employees' know-how development has an effect on firm performance, has also been presented in the literature (cf., Sirmon et al., 2007). In addition, Schroeder et al. (2002) have developed resource-based hypotheses and show a positive relationship between internal and external learning and manufacturing performance. Also Aragón-Correa et al. (2007) verify a positive and significant association between learning and performance. Based on the above, the hypothesis is as follows:

Hypothesis 4: The higher the firm's know-how development, the greater the firm's overall performance

### ***Regeneration and firm performance***

Organizations need to be tolerant of the mistakes that will occur and allow for recovery and learning from failures (Wan et al., 2005; Lawson and Samson, 2001) to achieve higher innovation capability. It has also been suggested that important issues for innovation are the belief that innovation is important, willingness to take risks, and willingness to exchange ideas (Wan et al. 2005). As a wide spread of innovation literature suggests, a firm's ability to

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regenerate affects its innovativeness and also its performance. Tellis et al. (2009) show that the willingness to cannibalize, future orientation, and tolerance for risk are drivers for radical product innovation, and that such innovations have a positive effect on the firm's financial performance. When firms frequently try out new ideas, seek new ways to do things, develop new product/services, and try to be creative in their methods of operation, they become more profitable, and get a higher market share and growth rate (Keskin 2006). The hypothesis is:

Hypothesis 5: The higher the firm's regeneration, the greater the firm's overall performance

### ***External knowledge and firm performance***

The firm's external partners are a key to its innovation. Interaction with suppliers, customers, industry associations, competitors and the like can provide missing external inputs that the organization itself cannot provide (Lawson and Samson, 2001; Romijn and Albaladejo, 2002). However, if firms do not translate the knowledge generated internally or acquired from the firm's external environment into new products or processes, superior performance will not be obtained (Fores and Camison, 2011). According to Chapman (2006) organizations using external sources achieve higher revenue growth than others. The study of Hung and Chiang (2010) reveals that concentrating on open innovation by improving innovation performance, not by developing all technologies themselves but by interacting with outside parties, can result in a higher performance. Chen and Chiang (2011) suggest that building network agility, i.e. customer agility, partnering agility, and operational agility, is a source for boosting operational performance, which then enhances financial performance. Therefore, on the basis of earlier literature, the following hypothesis can be formulated:

Hypothesis 6: The higher the firm's exploitation of external knowledge, the greater the firm's overall performance



### ***Individual activity and firm performance***

According to Hotho and Champion (2011) people who have creativity and intrinsic motivation (as well as skills) for their work will be favorable for creating a work environment that supports the creation of innovations. Also a studies of Beattie and Smith (2010) and Dixit and Nanda (2011) shows that the motivation of the employees is an important factor in a creative organization. According to Calantone et al. (2002), for effective innovation, established norms, practices, and beliefs may have to be challenged. So, as business realities change, the employees' behavior and actions need to be adjusted accordingly (Dobni, 2008). Finally, firms gain competitive advantage from their employee's motivation and activity as well. According to Steenkamp and Kashyap (2010), employee innovativeness is important to the future success of a firm and gives the firm a competitive advantage. Therefore, the individual activity of the employees should have an effect also on firm performance. The hypothesis is as follows:

Hypothesis 7: The higher the individual activity of the employees, the greater the firm's overall performance

### ***The research framework***

The theoretical review discussed above led to the research framework presented in Figure 1. As presented above, the aim of this study is to examine the relationship between innovation capability and firm performance. Innovation capability has been defined through aspects influencing an organization's capability to manage innovation. These aspects include participatory leadership culture, ideation and organizing structures, work climate and wellbeing, know-how development, regeneration, external knowledge, and individual activity. The basis of the framework is the idea that a firm has to concentrate on developing the seven aspects of innovation capability in order to achieve higher overall performance. In

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order to reach the research aim, seven hypotheses were developed, as presented above.

## **Methods**

### ***Data***

The data used to test the hypotheses was gathered from Finnish SMEs with a web-based questionnaire. The sample covered 2400 SMEs employing 11-249 persons and having a revenue of 2-50 Meuro. The sample was randomly selected with three restrictions: First, it was required that the firm had more than 10 employees to ensure the routines and processes of innovation capability to take place. Second, a representative of both management and employees received an invitation to participate in the study to make sure that both views would be represented in the study. Third, a valid e-mail address for each selected respondent was required, because the survey was web-based. 8,214 firms that met these three restrictions were found from the database. Although there are more SMEs that employ 10-249 employees and have revenue of 2-50 million euros in Finland, only 8,214 firms met the other requirements. The initial sample of 2,400 firms was selected randomly from among these 8,214 firms. The delivery of the questionnaire was conducted in four waves. One week after the survey was first mailed, reminder surveys were sent out. This process resulted in 311 responses, which equals a response rate of 7.68 percent. The background information of the informants is presented in Table 3.

### ***Development of the questionnaire***

The questionnaire developed for the study consisted of two major parts. The first part comprised 30 items measuring different issues related to innovation capability, divided into seven subcategories. The second part comprised 2 items measuring performance. The items were reviewed and revised with a group of researchers. The researchers were asked to

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critically analyze each of the items with respect to the concept it was intended to measure, as well as the appropriateness of each item.

The independent variables of the study were participatory leadership culture, ideation and organizing structures, work climate and wellbeing, know-how development, regeneration, external knowledge, and individual activity. Each of these variables was measured by a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). When possible, validated measures reported in previous research were used. When the items had to be modified, they were derived from the literature. The items are presented in Table 2.

The dependent variable, firm performance, was measured by two items. It has been demonstrated in the literature that there is a high correlation and concurrent validity between objective and subjective measurements (e.g., Venkatraman and Ramanujan, 1987). Therefore, the scale contained two subjective items (financial performance and operational performance over the past 3 years). Performance refers here to organizational level performance perceived by the individual respondent, which reflects the extent and degree to which the employee evaluates how the whole organization performs.

### ***Bias***

The potential for non-response bias can be assessed by comparing the means of the responses in the last quartile to those responses in the first three. It was assumed that those who were among the last to respond most closely resembled non-respondents (Armstrong and Overton, 1977). The management response and employee response analysis of variance tests were made separately. No significant differences were discovered in either group. Thus, non-response bias was not considered an issue in this study.

The sample was selected randomly, which can minimize voluntary response bias and under coverage bias. Harman's single-factor test was used to statistically address the issue of common method bias. All of the variables used in the study were loaded into exploratory factor analysis, and the unrotated factor solution was analyzed. Either of the criteria of the technique (i.e., emergence of a single factor from the factor analysis or one general factor accounting for the majority of the covariance of the measures) was met. Thus, no significant common method variance exists (Podsakoff et al., 2003).

## **Results**

The items, factor loadings, and reliability statistics are presented below. To assess the construct validity of the measurement scales, Factor Analysis (FA) was performed. As shown in Table 2, the results of the FA suggest that the standardized loadings are highly significant for all the remaining items (the loadings vary from 0.484 to 0.869), suggesting that the underlying constructs are valid.

To test the reliability of the results, a Cronbach's alpha test was performed. The alpha values of six factors, as shown in Table 4, are greater than 0.60. In one factor (individual activity) the alpha value is less than 0.50, which indicates that the reliability of the factor can be questioned, and therefore the results concerning the factor should be handled circumspectly.

Table 5 presents the means, standard deviations (SD) and intercorrelations of the variables used in this study. It was found that firm performance had a significant and positive correlation with two aspects of innovation capability, ideation and organizing structures and know-how development. The used analyses require normal distribution of the data. Skewness values outside the range of -1 to +1 are often defined as indicating a substantially skewed

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distribution (Hair et al., 2006). Based on these, the data was deduced to be in normal distribution ranges.

To assess whether the relationship between the aspects of innovation capability and performance was of different relevance for the overall responses, management responses and employee responses, the regression analyses were rerun for three split samples. Three control variables that might affect the relationship between a firm's innovation capability and performance were included: the industry and firm size (measured by both revenue and the number of employees).

The regression model (see Table 4), studying the relationship between innovation capability and overall performance, is significant. The results indicate that ideation and organizing structures and know-how development are positively related to the overall performance, and the participatory leadership culture is negatively related to the overall performance. No significant differences were found in the control variables as regards the overall performance.

When checking the relationship between innovation capability and overall performance from the perspective of management, the following was found: the regression model (Table 6) is significant, with 17 per cent of the variance explained. However, from the perspective of management, the results reveal a positive relationship between ideation and organizing structures and overall performance, and a negative relationship between a participatory leadership culture and overall performance. When checking the impact of the control variables, a positive association between revenue and overall performance, and a negative association between the number of employees and overall performance was found.

The next model, presented also in Table 6, investigates the effects of innovation capability to overall performance from the perspective of employees. This model is significant. The results indicate that according to the employees the only aspect of innovation

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capability that has a positive effect on overall performance is know-how development, which is consistent with the hypothesis. No significant differences were found in the control variables as regards the model. In sum, hypotheses 1, 2 and 4 are supported by the results of the study.

## **Discussion**

The paper has presented the results of a study investigating the relationship between organizational innovation capability and firm performance. The findings showed that three aspects of innovation capability, namely ideation and organizing structures, participatory leadership culture, and know-how development, have an effect on firm performance.

According to the results of the study, ideation and organizing structures are positively related to firm performance. This is in line with the study of Jiménez-Jiménez and Sanz-Valle (2011) which shows that organizational routines help firms to conduct their activities more efficiently and therefore obtain better performance. However, the impact of ideation and organizing structures was notable only from the perspective of the management. The employees did not consider them influential. This can be due to the fact that management benefits clear procedures through which they can monitor innovation process and related activities. Another aspect that has an effect on firm performance is a participatory leadership culture. Also a previous study of Zhu et al. (2005) concludes that leadership is one of the key driving forces for improving firm performance. However, in this study the effect was found to be negative between a participatory leadership culture and the overall performance. However, the impact of participatory leadership culture was notable and negative only from the perspective of the management. Management seem to consider their role in directing innovation activities towards successful ends rather than actively participating in innovation development. Contrarily, prior literature has indicated that participative management style is

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crucial for innovation (Wan et al., 2005). Know-how development was also found to be positively associated with overall performance. This positive relationship was found to be significant only from the perspective of the employees. From the perspective of the management, the relationship was not found to be influential. Also the previous studies of Schroeder et al. (2002) and Aragón-Correa et al. (2007) show a positive relationship between learning and performance. The results of this study also supports the idea that organizations should develop their employees' knowledge-base to adjust to the rapidly changing environment to achieve high performance.

The regression model investigating the issue from the perspective of management showed that also firm size, both revenue and the number of employees, can have an effect on the connection between aspects of innovation capability and firm performance. Previous studies have found firm size to be influential when developing innovations (e.g. Wolff and Pett, 2006; Plehn-Dujowich, 2009), and based on the results of the current study, this may be true also as regards the innovation capability of SMEs. Thus, more research is needed to clarify the differences of the innovation capability of SMEs of different size.

There are also four aspects of innovation capability that were not found to be influential when achieving higher performance. This may be a consequence of the fact that there are also many other things than innovation capability that affect a firm's overall performance. The results do not mean that these four aspects do not have value when enhancing performance. Although there are a variety of studies confirming the positive effect on innovativeness on firm performance (e.g. Cainelli et al., 2004; Jiménez-Jiménez and Sanz-Valle, 2011), the aspects that drive firm innovativeness do not necessarily lead to higher performance directly. For example, the study of Armbruster et al. (2008) shows that organizational innovations act as prerequisites and facilitators of an efficient use of technical product and process innovations, and therefore they are sources of competitive advantage.

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Organizational innovations themselves have an impact on productivity, lead times, quality and flexibility (Armbruster et al., 2008). Thus, the effects of innovation capability should be measured also by some intermediate measures. There are many things between a firm's capability to produce innovations and firm performance that affect the development of innovation capability as an asset of the firm. The true effects on innovation capability to firm performance may be difficult to track directly.

## **Conclusions**

This study has examined the impacts of innovation capability on firm performance on the perspectives of management and employees. Despite the literature suggesting a positive relationship between organizational innovation capability and performance, so far little research has analyzed the relationship by taking into account the various aspects of innovation capability in a single model. Two aspects of innovation capability, ideation and organizing structures, and know-how development, were found affect performance. The results also reveal that managers and employees have different perceptions on what aspects of innovation capability affect performance.

As a limitation, the empirical findings cover a specific country only and may not be fully generalized. In addition, a majority of the responses came from managers. Thus, managers' opinions are emphasized in the results. Due to the low response rate of employees, the results should thus be handled circumspectly.

The suggested future research directions are as follows. First, the relationship between a participatory leadership culture and firm performance was found to be negative. This result is somewhat contrary to previous research. Thus, the issue needs more research. Second, there were also four aspects of innovation capability that were not found to have a direct relationship with firm performance. Thus, there may be other aspects that moderate the



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relationship. Further studies should identify these aspects, so that the path from the aspects of innovation capability and firm performance could be defined more exactly.

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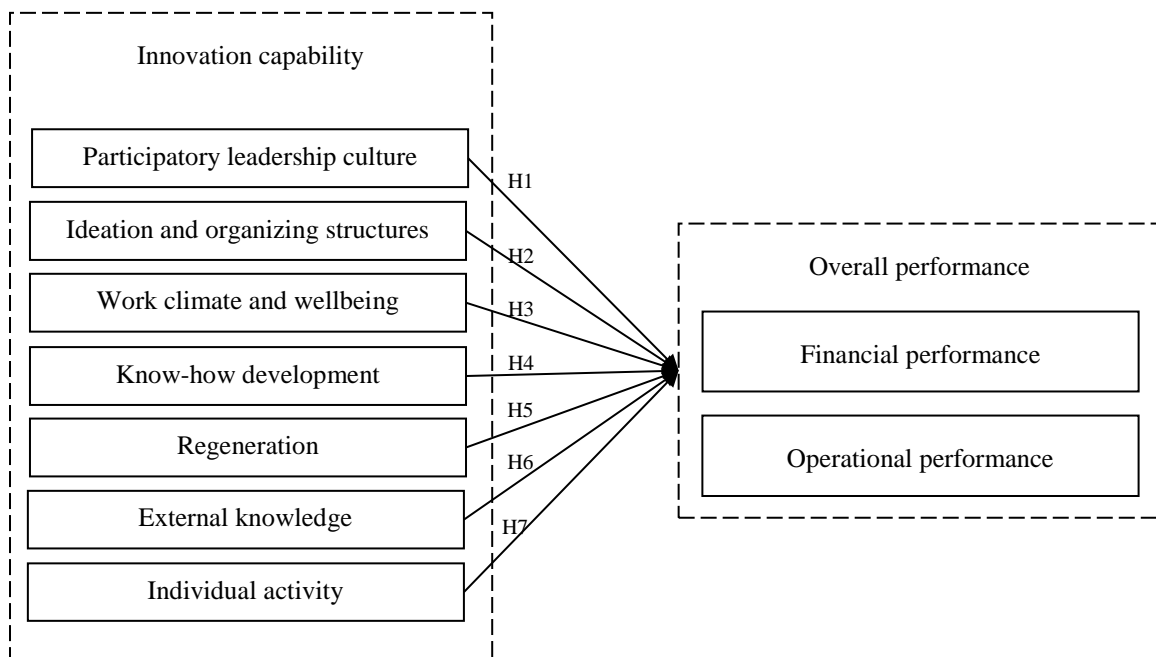


Figure 1. Research framework and hypotheses

Table 1. Dimensions of innovation capability

	<b>Leadership practices</b>	<b>Employees' skills and innovativeness</b>	<b>Processes and tools for idea management</b>	<b>Supporting culture</b>	<b>External sources for information</b>	<b>Development of individual knowledge</b>	<b>Employees' welfare</b>
Lawson and Samson, 2001		+	+	+		+	
Romijn and Albaladejo, 2002		+	+		+		
Calantone et al., 2002		+	+				
Subramaniam and Youndt, 2005		+	+	+			
Wan et al., 2005		+	+	+			
Adams et al 2006	+	+	+	+	+		
Perdomo-Ortiz et al., 2006	+	+	+	+	+	+	
Martensen et al., 2007	+	+	+		+		
Akman and Yilmaz, 2008	+	+		+	+	+	
Smith et al., 2008	+	+	+	+		+	
Laforet, 2011		+		+	+		
Martinez-Roman et al., 2011	+	+	+			+	
Saunila & Ukko, 2014	+	+	+	+	+	+	+

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Table 2. Prior studies indicating a positive relationship between innovation and performance

	Measure of innovation/innovation capability	Measure of performance	Effect
Subramanian and Nilakanta, 1996	the adoption of a large number of technical and administrative innovations	profitability by return on assets	+
Calantone et al., 2002	the rate of adoption of innovations, and the organization's willingness to change	objective firm performance (ROI, ROA, and ROS), and subjective firm performance (overall profitability)	+
Cainelli et al., 2004	presence or absence of innovation activities, and the total amount of resources per employee devoted to such activities	average growth rate of sales and employees, and sales per employee	+
Lloréns Montes et al., 2005	number of innovations introduced by the organization over a three-year period in relation to the number of innovations introduced by the excellent firms in the sector (technical and administrative innovation gap)	perceptual measure of financial and operative performance relative to that of other firms in the sector	+
Marsili and Salter, 2006	intensity of innovation expenditures (in design, R&C, machine, marketing)	the share of turnover attributed by a firm to type of innovation, the corresponding percentage of turnover, and the percentage of turnover attributed to improved products	+, design
García-Morales et al., 2007	subjective assessment of organizational innovation capability	SME performance with respect to its competitors	+
Akgün et al., 2009	subjective assessment of the rate of product and process innovation	firm performance relative to the achievement of organizational goals related to profitability and growth in sales and markets share	+
Rhee et al., 2010	subjective assessment of innovativeness	relative performance, including profitability, sales growth, and market share over the past 3 years, as compared with their principal competitor	+
Jiménez-Jiménez and Sanz-Valle, 2011	number of innovations, the proactive or reactive character of those innovations, and the resources the firm invests in innovation (product, process and administrative)	organizational performance assessed in terms of open/internal results, rational results, human relations results	+
Ar and Baki, 2011	product and process innovation	sales, profitability, and market share	+
Camisón and Villar-López, 2014	Assessment of organizational innovation (OI), product innovation capability (product IC), and process innovation capability (process IC)	objective firm performance (return on shareholders funds, return on capital employed, and return on total assets), and subjective firm performance (mean economic profitability, mean financial profitability, and mean sales profitability).	OI, product IC +
Sok et al., 2013	subjective assessment of innovation capability	SME performance compared to competitors	+
Bartolacci et al., 2015	investments in tangible and intangible fixed assets and type of innovation (product and process)	growth, profitability and productivity on a yearly basis	+, depends on size and cluster

Table 3. Background information of the informants

		n	%
Revenue (Meuro)	2-5	141	45.3
	5-20	135	43.4
	20-50	35	11.3
No of employees	10-49	224	72.0
	50-249	87	28.0
Industry	Industrial	145	46.6
	Service	159	51.1
	No response	7	2.3
Organizational position	Executive	222	71.4
	White-collar worker	68	21.9
	Blue-collar worker	12	3.9
	No response	9	2.9



Table 4. Means and standard deviations of the items, and parameter estimates for measurement relations

Item	Mean	Std. Dev.	Loadings	Cronbach's alpha
<b>Participatory leadership culture</b>	<b>3.65</b>	<b>0.613</b>		<b>0.803</b>
12 The managers encourage initiatives	3.72	0.912	0.769	
13 The managers give positive feedback	3.60	0.844	0.749	
14 The managers pass employees' ideas to the upper levels of the organization	3.67	0.864	0.747	
15 The managers participate in ideation and development	4.02	0.781	0.776	
23 There are practices for transferring tacit knowledge	3.12	1.055	0.573	
27 The employees are appreciated for their work	3.80	0.706	0.686	
<b>Ideation and organizing structures</b>	<b>3.45</b>	<b>0.628</b>		<b>0.708</b>
5 We have a clear way of processing and developing ideas	3.32	1.032	0.772	
6 The employees get feedback for their ideas	3.82	0.828	0.714	
7 Our reward system encourages ideating	2.86	1.062	0.689	
20 We have instructions and responsible persons for work orientation	3.66	1.061	0.553	
28 The number of working tasks is suitable	3.29	1.015	0.484	
29 The quality, demands and responsibility of tasks are suitable	3.73	0.807	0.624	
<b>Work climate and wellbeing</b>	<b>3.94</b>	<b>0.597</b>		<b>0.786</b>
4 Co-operation works well in our organization	3.84	0.852	0.704	
11 The employees have the courage to disagree	3.97	0.820	0.742	
21 The employees are encouraged to be multi-skilled	4.03	0.740	0.713	
25 The employees prosper in our organization	4.00	0.687	0.707	
26 The employees are treated equally	3.87	0.915	0.807	
<b>Know-how development</b>	<b>3.76</b>	<b>0.783</b>		<b>0.738</b>
19 All employees have a possibility for education	3.72	1.072	0.778	
22 Voluntary learning and development of expertise are supported in our organization	3.78	0.881	0.819	
24 In our organization, learning is an investment, not an expense	3.80	0.924	0.843	
<b>Regeneration</b>	<b>3.80</b>	<b>0.784</b>		<b>0.766</b>
8 Our organization seeks new ways of action actively	3.72	1.040	0.813	
9 Our organization has the courage to try new ways of action	3.83	0.941	0.869	
10 When experimenting with new ways of action, mistakes are allowed	3.86	0.860	0.799	
<b>External knowledge</b>	<b>3.96</b>	<b>0.733</b>		<b>0.625</b>
1 My work community encourages gaining knowledge through external contacts	4.00	1.042	0.742	
2 We have developed our ways of action by comparing our operations to other organizations	3.75	0.985	0.797	
3 We develop our actions together with our stakeholders (customers etc.)	4.13	0.864	0.731	
<b>Individual activity</b>	<b>3.59</b>	<b>0.612</b>		<b>0.486</b>
16 The employees are willing to participate in development	3.70	0.830	0.758	
17 It is easy for the employees to adopt new ways of action	3.12	0.959	0.764	
18 The employees know how to be critical towards current ways of action when needed	3.97	0.734	0.570	

Table 5. Means, standard deviations and intercorrelations of the variables

	Mean	SD	1	2	3	4	5	6	7
1 External knowledge	3.96	0.733	1.000						
2 Work climate and wellbeing	3.94	0.597	0.294***	1.000					
3 Ideation and organizing structures	3.45	0.628	0.256***	0.565***	1.000				
4 Regeneration	3.80	0.784	0.376***	0.443***	0.427***	1.000			
5 Participatory leadership culture	3.65	0.613	0.269***	0.632***	0.562***	0.532***	1.000		
6 Individual activity	3.59	0.612	0.161***	0.384***	0.285***	0.377***	0.408***	1.000	
7 Know-how development	3.76	0.783	0.225***	0.481***	0.484***	0.393***	0.466***	0.293***	1.000
8 Performance	2.68	0.713	0.006	0.109	0.225***	0.056	0.012	0.088	0.187**

Sign. \*\*\* ≤ 0.001, \*\* 0.001 < p ≤ 0.01, \* 0.01 < p ≤ 0.05

Table 6. Regression results of perceived overall performance

Dependent variable	Perceived overall performance					
	Overall		Management		Employees	
	Beta	t	Beta	t	Beta	t
<b>Independent variables</b>						
External knowledge	-0.045	-0.738	0.009	0.140	-0.127	-0.986
Work climate and wellbeing	0.032	0.398	0.089	1.189	0.053	0.400
Ideation and organizing structures	0.270	3.688***	0.329	4.661***	0.161	1.150
Regeneration	-0.011	-0.153	0.079	1.073	-0.130	-0.984
Participatory leadership culture	-0.212	-2.935**	-0.164	-2.255*	0.070	0.509
Individual activity	0.063	0.997	0.107	1.487	-0.157	-1.287
Know-how development	0.155	2.273*	0.076	1.052	0.376	3.318***
<b>Control variables</b>						
Revenue	0.104	1.780	0.265	3.263***	0.044	0.378
Number of employees	-0.113	-1.951	-0.313	-3.935***	-0.017	-0.150
Industry	0.053	0.895	0.038	0.581	0.127	1.107
F		8.759***		10.147***		11.012***
R		0.295		0.412		0.376
R <sup>2</sup>		0.087		0.170		0.141

Sign. \*\*\* ≤ 0.001, \*\* 0.001 < p ≤ 0.01, \* 0.01 < p ≤ 0.05