
Innovation capability for SME success: Perspectives of financial and operational performance

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Structured abstract

Purpose – The relationship between overall innovation and innovation capability, and performance has been a topic of several earlier studies (Calantone et al., 2002; Cainelli et al., 2004; Keskin, 2006; Bowen et al., 2010; Jiménez-Jiménez and Sanz-Valle, 2011). However, the effects of the aspects of innovation capability on performance of a firm have stayed unfamiliar. 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 affect firm performance. The effects are studied to both financial and operational performance.

Design/methodology/approach – The approach of this study is quantitative. 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.

Originality/value – Previous research has often either concentrated on innovation capability as a one dimension without studying the relationship aspect by aspect or studying only the effects of one aspect of innovation capability. Therefore, the results of the study take one step further by investigating the relationship of multiple aspects of innovation capability and firm performance.

Practical implications – The paper contains suggestions for improving performance through developing innovation capability. The paper aims to support practice in two ways. First, organizations can identify aspects of innovation capability that affect operational and financial performance. In that way, organizations can benefit the results by applying these aspects in their everyday operations. Second, the results of the paper may help professionals to begin to understand that leveraging innovation capability may improve an organization's performance.

Keywords – Innovation capability, Performance, Financial performance, Operational performance, SME

Paper type – Academic Research Paper

1 Introduction

Nowadays, when organizations operate in very challenging environments, developing innovation capability is vital. Innovation implies the adoption of a new idea or behavior (Jiménez-Jiménez and Sanz-Valle, 2011). The study of Dobni (2010) concludes that firms that possess high innovation orientations engage in value creation strategies, for example, developing new products/services. Innovation can also be regarded as an organizational capability, because it is an act that deploys resources with a new ability to create value (Yang et al., 2006). Therefore, developing innovation capability is important, as innovation plays a key role in the survival and growth of organizations (Francis and Bessant, 2005).

Innovation capability has been suggested to be a multi-faceted construct. The categories used in the area of innovation capability often adopt a certain type of innovation, such as product innovation or process innovation, instead of the overall innovation capability (Ibrahim et al., 2009). Also innovation capability has been divided into radical and incremental innovation capability (Sen and Egelhoff, 2000). Also the effects of innovation capability to firm performance have usually been studied by using the previously mentioned categories. According to Rosenbusch et al. (2011) only focusing on delivering innovative offerings to the market place might not fully leverage the potential of innovation. Small and medium sized enterprises (SME) can benefit even more if they develop, communicate, and embrace an innovation orientation. The empirical studies that discuss the organizational innovation capability (i.e. the aspects that affect managing innovation) as a whole and its impacts are rare. Thus, the question that have remained unsolved is does the individual aspects of innovation capability together have an impact on the performance of a firm.

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 affect firm performance. The effects are studied to both financial and operational performance. Previous research has often either concentrated on innovation capability as a one dimension without studying the relationship aspect by aspect or studying only the effects of one aspect of innovation capability. Therefore, the results of the study take one step further by investigating the relationship of multiple aspects of innovation capability and firm performance. The results contribute to the existing discussion on innovation capability – performance relationship by diminishing the gap between theory and practice and by building requisites for further research.

2 Literature review

2.1 Innovativeness and performance

According to Calantone et al. (2002) innovativeness is the most important determinant of an organization's performance. Tidd (2001) divides measures that are used to prove the

relationship between innovation and business performance, into two categories. The first group concerns accounting and financial performance. These measures include profitability, return on investment and share price. The second group concerns market performance, for example the share or growth (Tidd, 2001). Several studies have examined the relationship between innovation and firm performance (Calantone et al., 2002; Cainelli et al., 2004; Keskin, 2006; Bowen et al., 2010; Jiménez-Jiménez and Sanz-Valle, 2011) and supported to the idea that innovation is a key driver of firm success.

Also the effects of different types of innovations have been studied in earlier literature. Subramanian and Nilakanta (1996) found that different kind of innovations have an impact on different fields of performance. Organizational innovations improve coordination and co-operation in the organization, and they have been indicated also as better results in efficiency measures. Technical innovations improve the organization's competitiveness, and they have been shown to have a positive impact on the results of effectiveness measures (Subramanian and Nilakanta, 1996). According to Gopalakrishnan (2000), the speed and innovation magnitude are linked to the results of different measures of performance. Innovation speed has a strong impact on financial performance, measured by the average return on assets. However, innovation speed is not associated with executives' perceptions of overall performance. Innovation magnitude is associated with executives' positive perceptions of overall performance even though it does not have a significant impact on financial performance (Gopalakrishnan, 2000). On the other hand, Varadarajan (2009) points out that not only radical innovations but also incremental innovations are critical for the survival, growth, and profitability of organizations. On the basis of earlier literature, Armbruster et al. (2008) have shown 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 impact on business performance with regard to productivity, lead times, quality and flexibility (Armbruster et al., 2008).

As presented earlier, the relationship between overall innovativeness and performance has been a topic of several earlier studies. However, the effects of the innovation capability on performance of a firm have stayed unfamiliar. Some individual aspects and their relationship to performance have been studied but there is a lack of studies concentrating on the aspects of innovation capability as a whole for achieving higher performance. First it is however described more detailed what is referred when used the term innovation capability.

2.2 Innovation capability

Innovation capability has been suggested to be a multi-faceted construct. There is no common way of analysis by which to study it, due to the variety of perspectives of innovation management (Perdomo-Ortiz et al., 2006). According to Neely et al. (2001), an organization's innovation capability can be described as its potential to generate innovative outputs. Similarly, Lawson and Samson (2001), consider innovation capability as a theoretical framework aiming to describe the actions that can be taken to improve the success of innovation activities. Prajogo and Ahmed (2006) discuss the technological

factors of innovation management and human factors of innovation management. Human factors include the people and social practices as ingredients in organizational success. Martínez-Román et al. (2011) divide innovation capability in three dimensional factors: knowledge, organization and human factor. Perdomo-Ortiz et al. (2006) have used a 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.

Thus, one viewpoint is to point out 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 (Lawson and Samson, 2001; Perdomo-Ortiz et al., 2006; Martensen et al., 2007; Smith et al. 2008; Kallio et al., 2012; Saunila and Ukko, 2011). Similarly, in this study, innovation capability is defined to consist of the aspects influencing an organization's capability to manage innovation. In accordance with the earlier literature and the previous study of Saunila and Ukko (2011), innovation capability has been divided into seven aspects in this study: participatory leadership culture, ideation and organizing structures, work climate and wellbeing, know-how development, regeneration, external knowledge, and individual activity. Participatory leadership culture refers to the overall atmosphere of the organization that supports and motivates innovation, and also leadership that facilitates innovation. Work climate and well-being aspect represent the wellbeing of the employees and further the work climate for innovation development, including collaboration and values. Ideation and organizing structures is related to the structures and systems that successful innovation requires. This includes the generation, development and implementation of innovations, and the ways how the work tasks of the organization are organized. Know-how development aspect includes skills and knowledge of the employees that play an important role in innovation capability. This includes the utilization of knowledge as well as the improvement of employee skills. An external knowledge aspect highlights the importance of the proper behavior of exploiting external networks and knowledge to the overall organizational innovation capability. Regeneration reflects an organization's ability to learn from earlier experience and to use that experience to create innovations and develop their operations. Also employees' individual innovation capability and activity is needed to form the organization's overall innovation capability, which forms the employee activity aspect.

2.3 The research framework

The purpose of this study is to explore the impact of innovation capability on firm performance within the context of SMEs. The theoretical review discussed above lead to the research framework presented in Figure 1.

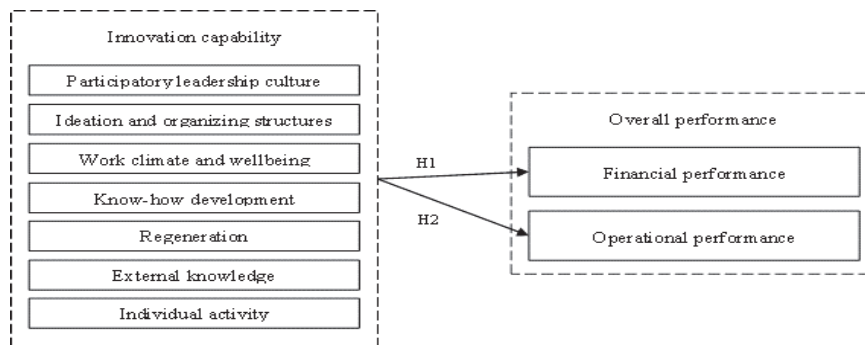


Figure 1 Research framework and hypotheses.

As mentioned earlier, the aim of this study is to examine the relationship between innovation capability and firm performance. Innovation capability has been defined via 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 firm has to concentrate on developing the seven aspects of innovation capability in order to achieve higher financial and operational performance. In order to reach the research aim, two hypotheses were developed. The hypotheses are as follows:

Hypothesis 1: The higher the firm’s innovation capability, the greater the firm’s financial performance

Hypothesis 2: The higher the firm’s innovation capability, the greater the firm’s operational performance

3 Methods

3.1 Questionnaire development

The approach of this study is quantitative. The questionnaire developed for the study consists of two major parts. The first part comprises 30 items measuring different issues related to innovation capability, divided into seven subcategories. The second part comprises 2 items measuring the performance. The items for the questionnaire were operationalized on the basis of a literature review. To maximize the validity and reliability of the construct, existing measurements that had been empirically tested were utilized when possible. New items were built on the basis of previous literature. The items were reviewed and revised with a group of researchers. The researchers were asked to critically analyze each of the items with respect to the concept it was intended to measure, on the appropriateness of each item, easiness of comprehension, and possible

improvements in wording. This resulted in minor changes to the presentation of the questionnaire.

3.2 Measures

The independent variables of the study are 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). A neutral response “neither disagree nor agree”, was adopted to reduce uninformed responses. Each of the independent variables was measured using 3-6 items. When possible, validated measures reported in previous research were used. When the items had to be modified, the items were derived from the literature. The study follows items modified from studies by Hurt et al. (1977), Samson and Terziovski (1999), Tang (1999), Calantone et al. (2002), Guan and Ma (2003), Ojala (2003), Wang and Ahmed (2004), Martensen et al. (2007), Dobni (2008), and Kallio et al. (2012).

The dependent variable, firm performance, was measured by two items. According to Bueno et al. (2010) the literature has widely established that there is a high correlation between objective and subjective data on performance, and therefore both are valid when calculating a firm's performance. In this study the subjective perceptions of the informants were used to measure the performance of the companies. Informants were asked to evaluate both the financial and operational (productivity, quality etc.) performance of the company within the past three years on a scale of 1 (weak) to 4 (excellent).

3.3 Data

The data used to test the hypotheses was gathered from Finnish SMEs with a web-based questionnaire. SMEs with less than 10 employees were excluded from the sample. The sample covered 2400 SMEs employing 11-249 persons and having a revenue of 2-50 Meuro. The sample was randomly selected. A representative of both management and employees received an invitation to participate in the study. Thus, 4800 questionnaires were sent. A total of 4050 questionnaires reached the informants, while 750 questionnaires were returned to the researchers with return to sender (RTS) messages, indicating that the addresses were no longer valid. The delivery of the questionnaire was conducted in four waves. One week after the first mailing of the questionnaire, reminder questionnaires were sent out. The remaining two reminders were sent a week after the previous reminder. This process resulted in a total of 311 responses, and after discounting the number of RTS mails, the final response rate accounted for 7.68 per cent.

To check the non-response bias, an analysis of variance (ANOVA) test was performed. The informants were divided into four groups: the first informants, the first follow-ups, the second follow-ups and the third follow-ups. The results of the ANOVA test revealed that there was no significant difference (at the 5 per cent significance level)

between the four groups. Therefore, it can be assumed that the responses reflect the whole sample well.

Table 1. Background information of the informants

		<i>n</i>	%
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

4 Results

The items, factor loadings, and reliability statistics are presented in the Appendix. To assess the construct validity of the measurement scales, Factor Analysis (FA) was performed. The seven scales were subjected to principal component analysis to test the unidimensionality of the constructs and to eliminate unreliable items. One item was excluded, because it loaded alone among other items into one factor. As shown, 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 value of six factors, as shown in Appendix, 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. The overall alpha value of the remaining 29 items is 0.903. The overall reliability of the construct is therefore supported. In order to assess the extent of multicollinearity, the variance inflation factor (VIF) was computed. The VIFs ranged from 1.015 to 1.382, which are significantly below the cut-off value of 10, and therefore it is suggested that multicollinearity do not cause problems.

The hypotheses were tested by using the linear regression method. The analyses were conducted on together in all innovation capability aspects and separately to financial and operational performance. Three control variables that might affect the relationship between firm innovation capability and performance were included: the industry and firm size (measured by both revenue and number of employees). A dummy variable was used for the industry, divided into manufacturing and service industries. The results reported in Table 2 support the hypotheses. Both models are significant. Innovation capability is significantly and positively related to financial and operational performance.

Table 2. Regression results of perceived financial and operational performance

<i>Dependent variable</i>	<i>Perceived financial performance</i>		<i>Perceived operational performance</i>	
	<i>Beta</i>	<i>t</i>	<i>Beta</i>	<i>t</i>
Independent variables				
External knowledge	0.007	0.110	-0.075	-1.235
Work climate and wellbeing	-0.059	-0.754	0.133	1.876
Ideation and organizing structures	0.266	3.695***	0.232	3.947***
Regeneration	0.014	0.197	-0.001	-0.022
Participatory leadership culture	-0.249	-3.476***	-0.054	-0.758
Individual activity	0.031	0.490	0.077	1.265
Know-how development	0.139	2.058*	0.060	0.901
Control variables				
Revenue	0.196	2.942**	0.112	1.923
Number of employees	-0.218	-3.285***	-0.082	-1.404
Industry	0.101	1.712	0.013	0.214
F		8.258***		15.578***
R		0.362		0.232
R ²		0.131		0.054
Adjusted R ²		0.115		0.050

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

The regression model investigating the relationship between innovation capability and financial performance is significant ($F = 8.258$, Sig. 0.000). The adjusted R^2 is 0.115, which shows that the model has a 11.5 per cent of the total variation in the dependent variable (financial performance). The standardized beta of ideation and organizing structures is 0.266 (Sig. 0.000), participatory leadership culture -0.249 (Sig. 0.001), and know-how development 0.139 (Sig. 0.041). The results indicate that the three aspects of innovation capability tends to be positively related to the financial performance, which is also consistent with the hypothesis. The size of the company (measured by revenue) also seems to be related to overall performance. Also number of the employees seems to be negatively related to overall performance.

The regression model investigating the relationship between innovation capability and operational performance is significant ($F = 15.578$, Sig. 0.000). However, the adjusted R^2 indicates that only 5.0 per cent of the variation in operational performance is explained by the model. The standardized beta of ideation and organizing structures is 0.232 and significant (Sig. 0.000). The results indicate that ideation and organizing structures tends to be positively related to operational performance, at least to some extent. This is also consistent with the hypothesis. No significant differences were found in control variables as regards the overall operational performance.

The results of regression models examining the impacts of innovation capability and firm's financial and operational performance suggest that performance of an organization can be affected by some aspects of innovation capability.

5 Discussion and conclusions

Despite the literature suggesting a positive relationship between organizational innovation capability and performance, so far little research analyzes the relationship taking into account the various aspects of innovation capability in a single model. In addition, previous research has concentrated on studying the effects of different types of innovations and organizational performance. This study goes a step further by studying the effects of firm's capability to produce innovations on organizational performance. The findings showed that three aspects of innovation capability, namely ideation and organizing structures, participatory leadership culture, and know-how development, has some effect on different aspects of firm performance. Surprisingly, the aspects of innovation capability were found to be more influential to the financial performance than operational performance.

According to the results of the study ideation and organizing structures are positively related to financial and operational performance. This is in line with the study of Jiménez-Jiménez and Sanz-Valle (2011) which show that organizational routines that help firms to conduct their activities more efficiently and, therefore, obtain better performance. When the structures and ways of working function well, employees have time to concentrate on completing their tasks. This means that management should organize the work in a way that it releases employees from the extra pressure concerning the ways of working. It means that managers should not be too tied in the daily routines, because it can result neglecting their main task, which is managing the company in relation to its strategic objectives. This conclusion is also supported by the results of this study. The effect was found to be negative between participatory leadership culture and financial performance. Also the previous study of Zhu et al. (2005) concludes that leadership is one of the key driving forces for improving firm performance. Despite participating in the daily routines to some extent, the leaders should not neglect the management part.

This study contains some interesting findings that would provide good starting point for further studies. First, the relationship between a participatory leadership culture and financial performance was found to be negative. This result is somewhat contrary to previous research. Thus, the issue needs more research. Second, it is not clear whether and to what extent each of the innovation capability determinants correlate with each of the overall performance constructs (productivity, profitability etc.). This should also be a subject of future studies. Third, the study did not clarify how a linkage between the aspects of innovation capability and firm performance can be made. Further studies are needed to formulate measures for both aspects of innovation capability and firm performance so that the causal relationships can be identified. Fourth, 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 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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Appendix.

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

<i>Item</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>St. loadings</i>	<i>Cronbach's alpha</i>
Participatory leadership culture	3.65	0.613		0.803
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	
Ideation and organizing structures	3.45	0.628		0.708
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	
Work climate and wellbeing	3.94	0.597		0.786
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	
Know-how development	3.76	0.783		0.738
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	
Regeneration	3.80	0.784		0.766
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	
External knowledge	3.96	0.733		0.625
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	
Individual activity	3.59	0.612		0.486
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	