



The impact of absorptive capacity on innovation capacity: an empirical study of Tunisian firms

Dr. Wafa Elleuch Maâzoun /Sfax University, Dr. Houda Khlif /Sfax University

Sfax University, Department of Management , Faculty of economics and management sciences , Sfax , Tunisia ; Sfax University, Department of Management , Faculty of economics and management sciences , Sfax , Tunisia
Email: elleuch.wafa84@gmail.com/ houda.khlif2@gmail.com

ABSTRACT

A review of the strategic management literature reveals an important emergence of research and studies on innovation, which is notably one of the main sources of competitive advantage. Several studies have shown that there is a positive and significant link between the absorptive capacity and the innovative activity of organizations. The underlying idea of these studies is that a high degree of absorptive capacity of a firm accentuates its innovative capacity. On the one hand, the importance of absorptive capacity and the need to innovate within firms have incited us to understand these research themes. On the other hand, the majority of works have analyzed each concept separately, without studying the relationships between them. In this context, the present study aims to identify the nature of the relationship between these two variables: absorption capacity and innovation capacity. To do this, a questionnaire was sent to a sample of 92 Tunisian companies. We referred to the linear regression method using the SPSS software 18 in order to analyze the data obtained. The results obtained showed that the absorption capacity accentuates the capacity to innovate of Tunisian companies. This research highlights the need as well as the importance of the absorptive capacity within Tunisian firms in order to maximize and boost their innovation capacity.

Keywords : absorption capacity, knowledge, innovation, exploitation, competitiveness.

1 INTRODUCTION

The central role of a firm's innovative capacity has been justified by several previous studies which have shown that innovative firms have advantages over other firms in terms of profitability, increased market value, higher quality, credit ratings and higher survival possibilities (Geroski, Machin and Van Reenen, 1993 and Czarnitzki and Kraft 2004). While being aware of the importance of innovation, every company seeks to diversify from its rivals and to have a competitive advantage that allows it to become a 'leader' in the market. To gain this advantage, the task is not at all easy and the responsibility of these firms is becoming ever greater, in the context in which we live.

The absorptive and innovative capacities of firms are widely studied in the literature, and these studies have contributed to the appearance of a rich literature on these concepts.

1. THE THEORETICAL FRAMEWORK OF THE RESEARCH

1.1. Absorptive capacity

The concept of absorptive capacity has been used in many research studies in different fields (economics, management, information systems). Moreover, absorptive capacity has become a key concept in several previous research studies on organizational learning, knowledge management, strategic alliances and innovation, which shows its importance in strategic management research. While absorptive capacity has gain attention in the last decade and has been the subject of many theoretical and empirical studies, this topic is still under investigation (Murovec and Prodan, 2009).

The absorptive capacity concept appeared firstly in the article by Cohen and Levinthal (1989-1990) entitled "Innovation and learning: the two faces of R&D". In this article they defined the concept as an ability to identify, assimilate and exploit

knowledge from the environment.

TABLE 1
BASIC DEFINITIONS OF ABSORPTIVE CAPACITY

Authors	Definition of absorption capacity	Newly introduced
Cohen et Levinthal (1989)	R&D activity develops the ability of a firm to identify, assimilate and exploit knowledge from the environment.	
Cohen et Levinthal (1990)	The ability to recognize the value of new external information, assimilate it and apply it for business purposes.	Valuable information/application for business purposes
Cohen et Levinthal (1994)	Absorptive capacity not only enables the firm to exploit external knowledge but also to accurately predict the nature of future technological advances.	Role in predicting possible advances

Zahra and George proposed another attempt to conceptualize this concept, on the one hand they underlined the dynamic character of the absorptive capacity, on the other hand they decomposed it into four dimensions namely; acquisition, assimilation, transformation and exploitation.

The authors distinguished between potential absorptive capacity (acquisition, assimilation) and realized absorptive capacity (transformation, exploitation) and therefore defined absorptive capacity as "the set of organizational routines and processes by which the firm acquires, assimilates, transforms and exploits knowledge in order to produce a dynamic organizational capability".

Finally the most recent definition is presented by Lane Koka and Pathak (2006), according to whom absorptive capacity is "The ability of a firm to use externally held knowledge through three sequential processes: Recognizing and understanding new external knowledge which are valuable for the firm through exploratory learning, assimilating new valuable knowledge through transformative learning and; using the assimilated knowledge to create new knowledge and outputs for commercialization through exploitative learning". Zahra and George (2002) emphasized that the construction of absorptive capacity should be understood from two perspectives: The potential absorptive capacity which is composed of acquisition and assimilation and the realized absorptive capacity which is composed of transformation and exploitation.

Potential absorptive capacity (PACAP):

According to the reflections of Zahra and George (2002) this capacity represents the external knowledge that the firm can absorb. Zahra and George, 2002 defined acquisition as the identification and acquisition of external knowledge that the organization will need. According to these authors acquisition has three characteristics which are intensity, speed and direction of external knowledge acquisition. In this context, assimilation is the capacity of the company to absorb external knowledge, and is also defined as the set of processes and routines for analyzing, transforming, interpreting, understanding, internalizing and classifying the new knowledge acquired. (Szulanski, 1996, Zahra and George, 2002).

Realised absorption capacity (RACAP) :

"Realised absorptive capacity refers to the ability to use and exploit newly acquired external knowledge.

RACAP shows the ability of an organization to integrate knowledge into production routines and processes once it is absorbed by the organization" (Clemente.R&Caulliraux.H&Meirelles.L.A&Proença.A, 2008).

According to Zahra and George (2002) transformation means the internalization of new knowledge; "It emphasizes the capacity of a society to develop and refine routines that facilitate the combination of existing knowledge with newly acquired knowledge, and to assimilate this knowledge. Exploitation is probably conceived as the most important phase for a company. Indeed, according to Cohen and Levinthal's (1990) definition, employees must be able to apply newly learned knowledge for the business purposes. This is a strategic dimension for the company, as it allows the generation of a set of results. After the effort of acquiring, assimilating and transforming knowledge, it the exploitation dimension comes which refers to the development of routines to apply knowledge and use it to create new goods, systems and processes (e.g. new organizational form) and the improvement of existing competences, or even the creation of new ones. (Jiménez-Barrionuevo, Garcia-Morales, and Molina ,2011)

1.2. The innovation capability

Research on innovation presents a wide variety of innovative capability definitions, and this literature allows us to distinguish

between them according to the research perspective adopted, for example, according to the behavioural sciences, "Innovative capability is the ability to develop new products in order to satisfy market needs, the ability to apply appropriate processes to produce these new products, the ability to develop and adopt new products and technological processes to satisfy future needs, and the ability to respond to competitors and to opportunities created by competitors" (Adler and Shenbar, 1990). (Adler and Shenbar, 1990). For Nonaka and Takeuchi (1995), the pioneers of the knowledge management movement, "innovation is based on a process of creating new knowledge. Now, this process involves a well-managed interaction between the company's knowledge and its economic and competitive environment".

2. THE DEVELOPMENT OF HYPOTHESIS

Kim (1998) pointed out that several studies have shown that a high absorptive capacity of new knowledge leads to a high degree of innovation and competitive advantage. In turn, Gold et al (2001) argued that a better use of existing knowledge is a key aspect of knowledge acquisition. Cohen and Levinthal (1998, 1990) suggest that a firm's ability to exploit external knowledge is a critical determinant of its innovative capacity: a firm will be more or less able to exploit technological opportunities in its environment depending on its knowledge base and the learning process which takes place within it. In the same perspective, Zahra and George (2002) have pointed out that absorptive capacity further the speed, frequency and scale of innovations, which in turn can produce knowledge that strengthens the firm's absorptive capacity. In the same context, Cassiman and Veugelers (2002) highlighted that innovation is a complex activity in which new knowledge is applied for business purposes, new knowledge is generated from a cumulative process in which knowledge is combined, deleted, transformed or simply reinterpreted, some of this existing knowledge is acquired from external sources. In this perspective Rosenberg (1982) has pointed out that externally generated knowledge represents a central element in the success of the firm's innovation activity. Moreover, Pennings and Harianto (1992), claimed that the ability of a firm to exploit external knowledge is one of the critical factors in the development of its innovative capacity. In this respect, Noteboom et al (2007), have pointed out that a strong absorptive capacity allows firms to be much better than others in capturing opportunities and creating value. This is because of their relationships with their subcontractors or technological innovation partners. These authors concluded that the external dimensions of open innovation and absorptive capacity are related to each other. In this context, firms that constantly invest in assimilating and exploiting new external knowledge are most likely to take advantage of environmental conditions change and innovative products generation that meet the needs of emerging markets (Chen and Huang, 2009; Jansen et al, 2006 and Lichtenthaler, 2009). Furthermore, Schilling (1998) argued that through absorptive capacity, firms expand their knowledge and skills, improve their ability to assimilate, use information and eventually their performance in technological change. Therefore, a higher absorptive capacity is able to increase the innovation performance of firms. In the same context, it is worth to note that absorptive capacity can affect the innovation activities efficiency, as Daghfous (2004) has pointed out that absorptive capacity allows firms to acquire external and internal knowledge and use it efficiently, which enhances their innovation capabilities.

Hargadon and Sutton (1997) argued that knowledge is propagated in an imperfect way between groups and units of the organization, thus, if there is knowledge exchange between units, ideas and information from one unit can make an innovative contribution to the other. Therefore absorptive capacity can contribute to innovation performance, being both a tool for processing new external knowledge, and also a channel for transferring the knowledge which is needed for inter-organizational innovation activities. Organizational absorptive capacity is largely dependent on individual capabilities, and this capacity enhances the firm's ability to transfer knowledge between the firm and its sub-units. A high level of absorptive capacity makes firms more likely to notice and exploit opportunities in their environment, and hence to become more proactive and innovative. (Cohen and Levinthal 1989; Anh, Baughn, Hang and Neupert, 2006; Escribano, Fosfuri and Tribó, 2007)

Also, Libo ,Shu and Zhihong (2009) confirmed the positive relationship between absorptive capacity and innovative capacity, indeed, they indicated that the successful exploitation of external knowledge helps firms to be the first to absorb this knowledge. In the same context, Vinding (2006) has shown in his research that the firm's ability to use external information not only enhances its innovative activity but also its ability to imitate innovations which are present in the market. Therefore, and based on this reasoning, we can say that a strong absorptive capacity improves the innovative capacity of firms, which allows us to present the following hypothesis:

Hypothesis 1: Absorptive capacity has a positive impact on the innovative capacity of the firm.

Hypothesis H1.1: Absorptive capacity has a positive impact on the product innovation capacity

H1.a1: acquisition has an impact on product innovativeness

H1.b1: assimilation has an impact on product innovation capacity

H1.c1: transformation has an impact on product innovation capacity

H1.d1: exploitation has an impact on product innovation capacity

Hypothesis H1.2: Absorptive capacity has a positive impact on process innovation capacity

H1.a2: acquisition has an impact on process innovation capacity

H1.b2: assimilation has an impact on process innovation capacity

H1.c2: transformation has an impact on process innovation capacity

H1.d2: exploitation has an impact on process innovation capacity

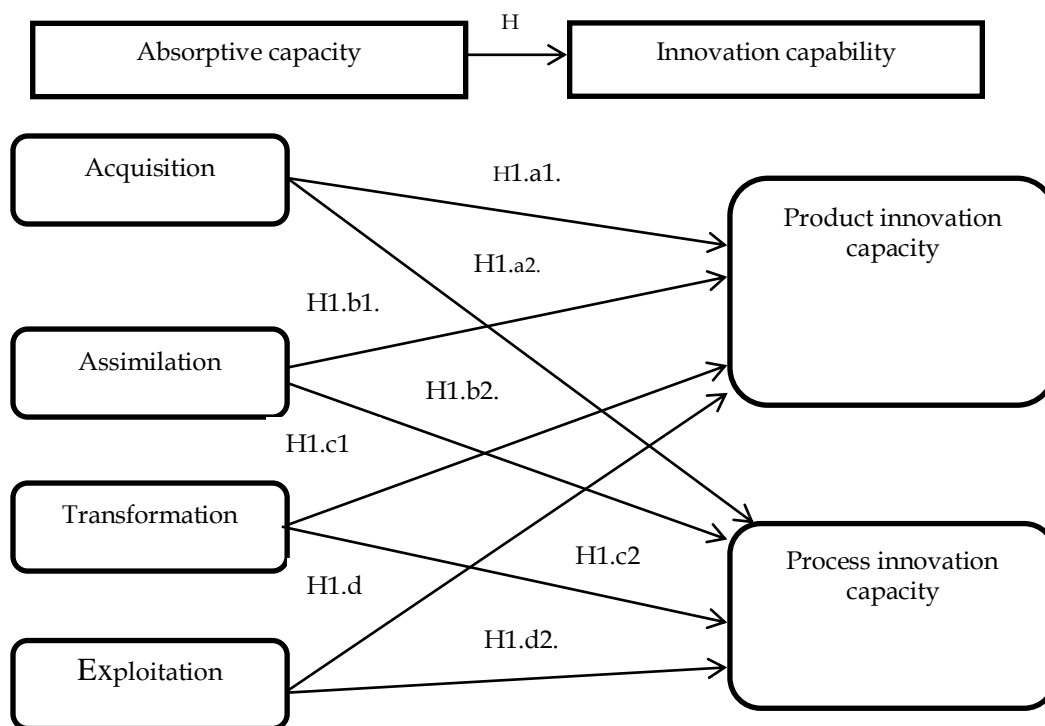


Fig. 1. The conceptual model of research

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3. RESEARCH METHODOLOGY:

Our research is a quantitative hypothetico-deductive research, we have prepared a questionnaire extracted from the literature. The questionnaire was sent to 180 Tunisian companies, but only 92 questionnaires were filled in by the companies surveyed. After collecting the data we used linear regression to test our research hypotheses.

In the following, we will present the measures of the variables.

❖ Absorptive capacity: explanatory variable

For the absorption capacity measurement, we chose the items mentioned below with reference to Chauvet (2008). This operationalization of absorptive capacity synthesizes the measures proposed by several theorists (Appendix 2).

Innovation capacity: a variable to be explained

We based on the measurement scale of Chen (2007) presented in (Appendix 3).

4. ANALYSIS AND INTERPRETATION OF THE RESULTS

4.1 Results of the exploratory factor analysis

The conceptual model of our research is formed by two main variables: absorptive capacity and innovative capacity.

❖ The unidimensionality of the measurement scale "absorptive capacity"

The value of KMO being 0.849 shows a good integrity between items. The data can be subjected to factor analysis. This result is further assessed with the reliability indices related to the selected factors deemed acceptable. Also, the high factor contributions of these items (>0.7) and their good representational quality (>0.5) verify the unidimensionality of the scale.

We found that some variables are not clearly ranked to one factor or another. For this reason, we use the axes rotation method to improve their belonging to the factors. The items selected form four factors that account for 72.279% together. The first factor is made up of 13 items reflecting the "acquisition" dimension. A Crombach alpha value of 0.960 indicates good reliability. The second factor is formed by three items reflecting the dimension "assimilation". A Crombach alpha value of 0.816 indicates good reliability.

The third factor is formed by three items reflecting "transformation". A Crombach alpha value of 0.729 indicates acceptable reliability. The fourth factor is formed by a single item reflecting "exploitation".

TABLE 2
Factor structure: absorption capacity

Items	% contribution to factor formation.			
	F1= 44,219%	F2=11,603%	F3=10,007%	F4= 6,450%
Risktolerance	0,716			
Support from the manager	0,761			
Training	0,834			
R&D investment	0,773			
Knowledgerepertoires	0,856			
Knowledgeintensity	0,826			
Experience of R&D department	0,903			
Last degree of employee	0,844			
Intensity	0,858			
Observation	0,817			
Speed	0,778			
Knowledge catalyts	0,846			
Interpretation		0,837		
Comprehension		0,877		
Formalisation		0,808		
Recoding			0,851	
Questioning			0,725	
Adaptability			0,824	
Commitment of resources				0,828
Implementation Key skills	0,830			

Source SPSS, 18

❖ **The unidimensionality of the "innovation capacity" measurement scales**

The factor analysis shows that the data matrix of the innovation capacity measurement scale can be a subject of factor analysis:

*KMO = 0, 883 is greater than 0.5. This value shows good integrity between items.

*Bartlett's test shows that all variables are perfectly independent from each other ($p = .000 < 0.05$; Chi-square = 1224.256).

*The MSA values are all above 0.5.

This result is further appreciated with the reliability indices related to the selected factors deemed acceptable.

We notice from the above table that the quality of representation of item 8 is lower than 0.5, so we will eliminate it.

After the elimination of this item, we noticed that some variables are not clearly ranked to one factor or another. For this reason, we use the axes rotation method in order to improve their belonging to the factors.

The items selected form two factors that together account for 66.034%.

The first factor is made up of 13 items reflecting the dimension "process innovation". A Crombach alpha value of 0.948 indicates good reliability value.

The second factor is formed by three items reflecting the dimension "product innovation". A Crombach alpha value of 0.887 indicates good reliability value.

TABLE 3:
 Factor structure: innovative capacity

Items	Items % contribution to factor formation.	
	F1= 42,748%	F2=23,286 %
innov1		0,689
Innov2		0,757
Innov3		0,768
Innov4		0,778
Innov5		0,730
Innov6		0,742
Innov7	0,738	
Innov9	0,825	
Innov10	0,795	
Innov11	0,788	
Innov12	0,749	
Innov13	0,763	
Innov14	0,855	
Innov15	0,804	
Innov16	0,839	
Innov17	0,815	
Innov18	0,822	

Source SPSS, 18

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- a. Analysis and interpretation of the linear regression results
 For our study, we used linear regression to analyze our research data.
- The effect of absorptive capacity on innovative capacity (H1)

TABLE 4:
Effect of absorptive capacity on innovative capacity

Variables to be explained	Process innovation	Product innovation
Explanatory variables		
Acqui	0,974**	0,445**
assiml	0,564**	0,938**
transf	0,420**	0,079**
explo	0,284**	0,201**
Coefficient of determination	0,959	0,886
Fisher's F coefficient	513,434	168,849
Significance of F	0,000	0,000
Durbin-Watson	1,481	2,297

Source SPSS, 18

*** $p < 0.01$ ** $p < 0.05$ * $p < 0.1$

Table 4 shows that the dimensions of "absorptive capacity" construct have Betas that are respectively

acquired: $\beta = .974^{**}$; $p = 0.000 < 0.005$

assiml: $\beta = .564^{**}$; $p = 0.003 < 0.005$

transf: $\beta = .420^{**}$; $p = 0.004 < 0.005$

explo: $\beta = .284^{**}$; $p = 0.000 < 0.005$

In other words, absorptive capacity has a significant impact on the company's process innovation capacity. Therefore, hypothesis H2.1 is confirmed.

From the above table, we can conclude that the dimensions of the "absorption capacity" construct have Betas that are respectively

acquired: $\beta = .445^{**}$; $p = 0.003 < 0.005$

assiml: $\beta = .938^{**}$; $p = 0.000 < 0.005$

transf: $\beta = .079^{**}$; $p = 0.001 < 0.005$

explo: $\beta = .201^{**}$; $p = 0.000 < 0.005$

In other words, absorptive capacity has a significant impact on the company's product innovation capacity. Therefore, hypothesis H2.2 is confirmed.

5 CONCLUSION

In the current context of rude competition and a rapidly evolving environment, it is crucial for all companies to innovate. Our research addresses a key question: how can these companies enhance their innovation capabilities?

We conclude that absorptive capacity is a significant factor that positively impacts the innovation potential of Tunisian firms.

The study of the relationship between absorptive capacity and innovation capacity helps managers to improve their innovation capacities, thus the results obtained confirm the positive role of absorptive capacity on innovation capability, which will allow the manager to know the importance of this factor and try to improve it.

Our research provides support to strategic decisions for tunisian business leaders . The theoretical part offers a clarification of the concepts "absorption capacity" and "innovation capacity As for the empirical part, it helps to identify and better understand the effect of absorptive capacity on the innovative activity of companies.

REFERENCES

- [1] Adler, P. S. (1990). Shenbar. Adapting Your Techno—logical Base: The OrganizatiOnal Challenge.
- [2] Anand, G., Ward, P. T., & Tatikonda, M. V. (2010). Role of explicit and tacit knowledge in Six Sigma projects: An empirical examination of differential project success. *Journal of Operations Management*, 28(4), 303-315.
- [3] Anh, P. T. T., Baughn, C. C., Hang, N. T. M., & Neupert, K. E. (2006). Knowledge acquisition from foreign parents in international joint ventures: An empirical study in Vietnam. *International Business Review*, 15(5), 463-487.
- [4] Argyris, C., & Schön, D. A. (1997). Organizational learning: A theory of action perspective. *Reis*, (77/78), 345-348.
- [5] Autio, E., Sapienza, H. J., & Almeida, J. G. (2000). Effects of age at entry, knowledge intensity, and imitability on international growth. *Academy of management journal*, 43(5), 909-924.
- [6] Barkema, H. G., & Vermeulen, F. (1998). International expansion through start-up or acquisition: A learning perspective. *Academy of Management journal*, 41(1), 7-26.
- [7] Boutelilene, S. (2005). Management des connaissances et processus d'innovation.
- [8] Cassiman, B., & Veugelers, R. (2002). Complementarity in the innovation strategy: internal R&D, external technology acquisition and cooperation.
- [9] Chauvet, V. (2003). Construction d'une échelle de mesure de la capacité d'absorption. In Actes du 12ème Colloque de l'AIMS, Sfax (Tunisie), 3 au 6 juin 2003
- [10] Clemente, R. G., Caulliraux, H. M., Meirelles, L. A., & Proença, A. (2008). A reference framework to support absorptive capacity development.
- [11] Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: the two faces of R & D. *The economic journal*, 99(397), 569-596.
- [12] Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative science quarterly*, 128-152.
- [13] Cohen, W. M., & Levinthal, D. A. (1994). Fortune favors the prepared firm. *Management science*, 40(2), 227-251.
- [14] Czarnitzki, D., & Kraft, K. (2004). Firm leadership and innovative performance: Evidence from seven EU countries. *Small Business Economics*, 22(5), 325-332.
- [15] Daghfous, A. (2004). Absorptive capacity and the implementation of knowledge-intensive best practices. *SAM Advanced Management Journal*, 69(2), 21.
- [16] Davenport, T. H., & Prusak, L. (1998). Working knowledge: How organizations manage what they know. Harvard Business Press.
- [17] Dehan, M., Gold, F., Grassin, M., Janaud, J. C., Morisot, C., Ropert, J. C., & Siméoni, U. (2001). Dilemmes éthiques de la période périnatale: recommandations pour les décisions de fin de vie. *Archives de pédiatrie*, 8(4), 407-419.
- [18] Diani, M. (2002, September). Connaissance et performance économique: Une nouvelle vision de la firme dans une économie basée sur la connaissance. In ACS conference.
- [19] Escribano, A., Fosfuri, A., & Tribo, J. A. (2009). Managing external knowledge flows: The moderating role of absorptive capacity. *Research Policy*, 38(1), 96-105.
- [20] Geroski, P., Machin, S., & Van Reenen, J. (1993). The profitability of innovating firms. *The RAND Journal of Economics*, 198-211.
- [21] Hargadon, A., & Sutton, R. I. (1997). Technology brokering and innovation in a product development firm. *Administrative science quarterly*, 716-749.
- [22] Henderson, R., & Cockburn, I. (1994). Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic management journal*, 15(S1), 63-84.
- [23] Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization science*, 2(1), 88-115.
- [24] Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation and performance: Effects of organizational antecedents and environmental moderators. *Management Science*, 52(11), 1661-1674.
- [25] Jensen, M. B., Johnson, B., Lorenz, E., Lundvall, B. Å., & Lundvall, B. A. (2007). Forms of knowledge and modes of innovation. *The learning economy and the economics of hope*, 155.
- [26] Jiménez-Barrionuevo, M. M., García-Morales, V. J., & Molina, L. M. (2011). Validation of an instrument to measure absorptive capacity. *Technovation*, 31(5-6), 190-202.
- [27] Kim, L. (1998). Crisis construction and organizational learning: Capability building in catching-up at Hyundai Motor. *Organization science*, 9(4), 506-521.
- [28] Koskinen, K. U., Pihlanto, P., & Vanharanta, H. (2003). Tacit knowledge acquisition and sharing in a project work context. *International journal of project management*, 21(4), 281-290.
- [29] Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic management journal*, 19(5), 461-477.
- [30] Lane, P. J., Koka, B. R., & Pathak, S. (2006). The reification of absorptive capacity: A critical review and rejuvenation of the construct. *Academy of management review*, 31(4), 833-863.
- [31] Liao, S. H., Fei, W. C., & Chen, C. C. (2007). Knowledge sharing, absorptive capacity, and innovation capability: an empirical study of Taiwan's knowledge-intensive industries. *Journal of information science*, 33(3), 340-359.
- [32] Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes. *Academy of management journal*, 52(4), 822-846.
- [33] Liu, H., Ke, W., Wei, K. K., Chen, H., Gu, J., & Huang, Q. (2009). From IT capabilities to supply chain performance: The mediating effects of supply chain agility and absorptive capacity. *AMCIS 2009 Proceedings*, 225.
- [34] Lund Vinding, A. (2006). Absorptive capacity and innovative performance: A human capital approach. *Economics of innovation and New Technology*, 15(4-5), 507-517.
- [35] Massa, S., & Testa, S. (2004). Innovation or imitation? Benchmarking: a knowledge-management process to innovate services. *Benchmarking: An International Journal*.
- [36] Murovec, N., & Prodan, I. (2009). Absorptive capacity, its determinants, and influence on innovation output: Cross-cultural validation of the structural model.

Technovation, 29(12), 859-872.

- [37] Nonaka, I., & Takeuchi, H. (1995). *The Knowledge Creating*. New York, 304.
- [38] Nooteboom, B., Van Haverbeke, W., Duysters, G., Gilsing, V., & Van den Oord, A. (2007). Optimal cognitive distance and absorptive capacity. *Research policy*, 36(7), 1016-1034.
- [39] Pennings, J. M., & Harianto, F. (1992). The diffusion of technological innovation in the commercial banking industry. *Strategic management journal*, 13(1), 29-46.
- [40] Rosenberg N (1982) *Inside the black box: technology and economics*. Cambridge University Press, Cambridge
- [41] Stollberg, M., Zhdanova, A. V., & Fensel, D. (2004). H-Techsight—A next generation knowledge management platform. *Journal of Information & Knowledge Management*, 3(01), 45-66.
- [42] Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal*, 17(S2), 27-43.
- [43] Zahra, S. A., & George, G. (2002). The net-enabled business innovation cycle and the evolution of dynamic capabilities. *Information systems research*, 13(2), 147-150.

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