

6-15-2020

KNOWLEDGE SHARING AND KNOWLEDGE PROTECTION IN INTER-ORGANIZATIONAL COLLABORATION: UNCOVERING THE UNDERLYING RELATIONSHIPS THAT INFLUENCE INNOVATION

Mirian Oliveira

Pontifícia Universidade Católica do Rio Grande do Sul, miriano@pucrs.br

Carla Curado

Universidade de Lisboa, ccurado@iseg.ulisboa.pt

Andrea Raymundo Balle

UniFBV, arballe@gmail.com

Felipe Nodari

Pontifícia Universidade Católica do Rio Grande do Sul, fnodari@gmail.com

Plinio Silva de Garcia

Pontifícia Universidade Católica do Rio Grande do Sul, plinio.garcia@edu.pucrs.br

Follow this and additional works at: https://aisel.aisnet.org/ecis2020_rip

Recommended Citation

Oliveira, Mirian; Curado, Carla; Balle, Andrea Raymundo; Nodari, Felipe; and Silva de Garcia, Plinio, "KNOWLEDGE SHARING AND KNOWLEDGE PROTECTION IN INTER-ORGANIZATIONAL COLLABORATION: UNCOVERING THE UNDERLYING RELATIONSHIPS THAT INFLUENCE INNOVATION" (2020). *ECIS 2020 Research-in-Progress Papers*. 10.
https://aisel.aisnet.org/ecis2020_rip/10

This material is brought to you by the ECIS 2020 Proceedings at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2020 Research-in-Progress Papers by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

KNOWLEDGE SHARING AND KNOWLEDGE PROTECTION IN INTER-ORGANIZATIONAL COLLABORATION: UN- COVERING THE UNDERLYING RELATIONSHIPS THAT INFLUENCE INNOVATION

Research in Progress

Oliveira, Mírian, Pontifícia Universidade Católica do Rio Grande do Sul and Universidade de Lisboa, Porto Alegre-RS, Brazil, miriano@pucrs.br

Curado, Carla, Universidade de Lisboa, Lisbon, Portugal, ccurado@iseg.ulisboa.pt

Balle, Andrea R., Centro Universitário FBV, Recife, Brail, arballe@gmail.com

Nodari, F., Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre-RS, Brazil, fnodari@gmail.com

Garcia, Plínio Silva de, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre-RS, Brazil, plinosilvadegarcia@gmail.com

Abstract

This research addresses the sources of absorptive capacity that influence innovation considering the dynamics of knowledge, since the balance between knowledge protection and inter-organizational knowledge sharing may enhance innovation. We examine the literature that suggests organizational absorptive capacity plays a significant role in achieving innovation. This research in progress proposes two alternative research models based on following constructs knowledge protection, inter-organizational knowledge sharing, potential absorptive capacity, realized absorptive capacity and innovation. This original contribution seeks to expand the recent literature on knowledge protection specifically at the inter-organizational level. Both models can be used to deliver relevant contributions on either the mediating or moderating influence of knowledge protection. The theoretical contributions illustrate a) the mediating role of inter-organizational knowledge sharing between the potential and realized absorptive capacity, and b) clarify the influence knowledge protection has on inter-organizational knowledge sharing, and the potential and the realized absorptive capacity. Furthermore, the empirical findings are expected to a) show managers how inter-organizational knowledge sharing mediates the potential and realized absorptive capacity, thus enabling innovation, and b) alert managers to the possible negative influence of knowledge protection on absorptive capability, inter-organizational knowledge sharing and innovation.

Keywords: *Inter-organizational knowledge sharing, Knowledge protection, Innovation, Absorptive capacity.*

1 Introduction

Digital technologies may lead enterprises to change their business models resulting in modified products, structures or process. (Hess *et al.*, 2016). In the era of digital transformation, organizational boundaries are blurring and the way employees interact is changing, which promotes greater inter-organizational networking (Ilvonen *et al.*, 2018). Knowledge sharing “is the process where individuals mutually exchange their knowledge and jointly create new knowledge (Hooff and Ridder, 2004, p. 118). In the case of inter-organizational knowledge sharing, the individuals are part of different organizations. Collaboration with external partners is positive for innovation, although it has challenges (Jean, Sinkovics and Hiebaum, 2014). Inter-organizational knowledge sharing makes organizations vulnerable to unintended knowledge leakage (Estrada, Faems and Faria, 2016). Thus, organizations need to balance inter-organizational knowledge sharing and knowledge protection (Foege *et al.*, 2019; Yang *et al.*, 2014).

Knowledge protection means “to prevent knowledge within an organization from being inappropriately or illegally used or stolen by other organizations” (Liu and Deng, 2015, p. 124). Knowledge leaks are a risk for organizations (Gast *et al.*, 2019) given that knowledge is an important intangible asset to achieve sustainable competitive advantage (Grant, 1996). Knowledge protection mechanisms enable organizations to mitigate the risk of unintended knowledge leakage (Estrada, Faems and Faria, 2016). While protection mechanisms are in part based on information technology, they also depend employee behaviour (Gold, Malhotra and Segars, 2001; Ilvonen *et al.*, 2018).

Knowledge protection and knowledge sharing are not incompatible (Yang *et al.*, 2014). Nevertheless, establishing the balance between inter-organizational knowledge sharing and knowledge protection so as to increase innovation is a challenge in the era of digital transformation (Ilvonen *et al.*, 2018). Innovation is “the production or adoption of novel and useful systems, processes, products or services” (Yoo, Vonderembse and Ragu-Nathan, 2010, p. 333).

Inter-organizational knowledge sharing influences innovation mediated by absorptive capacity (Nodari, Oliveira and Maçada, 2016). Absorptive capacity (ACAP) is “a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability” (Zahra and George, 2002, p. 186). Absorptive capacity is widely responsible by knowledge flows in most cases (Hurmelinna-Laukkanen *et al.*, 2012). There is a lack of consensus regarding the relationship between inter-organizational knowledge sharing and absorptive capacity, some authors believe absorptive capacity influences inter-organizational knowledge sharing (for example, Baker and Yousof, 2017), while others consider inter-organizational knowledge sharing influences absorptive capacity (for example, Nodari, Oliveira and Maçada, 2016).

Zahra and George (2002) classified absorptive capacity into two types, potential absorptive capacity (PACAP) and realized absorptive capacity (RACAP). The ability to identify and assimilate new knowledge (PACAP) will contribute to inter-organizational knowledge sharing, which in turn will increase the stock of knowledge, which will facilitate the transformation and exploitation (RACAP) of new knowledge. Kang and Lee (2017) tested PACAP as an antecedent of intra-organizational knowledge sharing and RACAP as a consequent of intra-organizational knowledge sharing, in the research and development department of a multinational electronics company in South Korea. These authors showed absorptive capacity as antecedent and consequent of inter-organizational knowledge sharing for the first time. Therefore, it is necessary verify it in other sectors and cultures.

In summary, this research seeks to address two gaps in the literature. First, the apparently limited understanding of how two seemingly conflicting goals – inter-organizational knowledge sharing and knowledge protection – can influence innovation. The research findings will contribute to a better understanding of the balance between inter-organizational knowledge sharing and knowledge protection and their role in stimulating innovation. Second, despite prior studies suggesting that innovation may be increased by knowledge sharing and absorptive capacity, empirical research investigating the influence of inter-organizational knowledge sharing, PACAP and RACAP on innovation is scarce. This research will expand the research of Kang and Lee (2017), once it add a new construct (knowledge

protection), relationship between PACAP and RACAP, and it is applied in a different culture. This study aims to answer the following question: how two seemingly conflicting goals – inter-organizational knowledge sharing and knowledge protection – can influence IN?

Accordingly, the goal of this research is to propose a research model considering four constructs, namely knowledge protection, inter-organizational knowledge sharing, potential absorptive capacity and realized absorptive capacity and their influence on innovation. Following this introduction, this article is structured as following. Section 2 contains a review of the literature on the relationship between knowledge protection, inter-organizational knowledge sharing, absorptive capacity and innovation. Section 3 describes the methodological procedures to be adopted in the next stages of this research. Section 4 reports the conclusion.

2 Literature review and hypotheses

Absorptive capacity was developed by Cohen and Levinthal (1990), considering the external knowledge in the organizational level. Zahra and George (2002) expanded this theory, by specifying the dimensions of absorptive capacity: acquisition, assimilation, transformation and exploitation of knowledge. Absorptive capacity has been used in a variety of researches, such as knowledge management (Alavi and Leidner, 2001), information technology governance (Ali, Green and Robb, 2013) and business intelligence and analytics (Božič and Dimovski, 2019).

According to Nodari, Oliveira and Maçada (2016), inter-organizational knowledge sharing does not directly influence innovation, rather, this relationship is mediated by absorptive capacity. The influence of inter-organizational knowledge sharing on ACAP is identified by Ritala and Hurmelinna-Laukkanen (2013). In both cases, absorptive capacity is represented by one construct. Nevertheless, absorptive capacity is a multi-dimensional concept (Zahra and George, 2002).

Considering the multi-dimensional nature of absorptive capacity, Zahra and George (2002) classified it into potential (knowledge acquisition and assimilation) and realized (knowledge transformation and exploitation). Kang and Lee (2017) found intra-organizational knowledge sharing mediated the relationship between PACAP and RACAP. Nevertheless, the direct relationship between PACAP and RACAP was not tested by Kang and Lee (2017).

Collaboration with external partners (customers, suppliers, competitors, universities, research centres and government) can enhance knowledge sharing and an organization's knowledge base, and in the presence of absorptive capacity, it can result in innovation (Najafi-Tavani *et al.*, 2018). The same authors suggested collaboration with suppliers can help process innovation, but only in the presence of a high level of absorptive capacity.

A dynamic relationship between absorptive capacity and inter-organizational knowledge sharing is created using PACAP and RACAP. The potential absorptive capacity facilitates the identification of new knowledge and its value, which may influence inter-organizational knowledge sharing. On the other hand, inter-organizational knowledge sharing increases the stock of knowledge, which may facilitate realized absorptive capacity. Mennens *et al.* (2018), Limaj and Bernroider (2019) and Khan, Lew and Marinova (2019) found PACAP has a positive effect on RACAP, which is aligned with the concept of absorptive capacity. Based on that, this research proposes the following hypotheses:

H1a: PACAP positively influences inter-organizational knowledge sharing;

H1b: inter-organizational knowledge sharing positively influences RACAP;

H1c: PACAP positively influences RACAP.

Information technology facilitates cooperation between enterprises on the same horizontal level in a business sector, as well as vertical cooperation between customers and suppliers (Loebbecke, Fenema and Powell, 2016). Technological mechanisms such as e-mail or wikis are widely used to share technical knowledge between companies, while other mechanisms can be used to share managerial knowledge (Balle *et al.*, 2019). This exposure to different types of external knowledge from different sources can lead to product innovation (Ardito and Petruzelli, 2017), with the link being the absorptive capacity.

The influence of absorptive capacity on innovation is brought to light by Zahra and George (2002). Nodari, Oliveira and Maçada (2016) and Wang, Yang and Xue (2017) confirmed the influence of absorptive capacity on innovation, but they did not consider the division between potential and realized absorptive capacity. Mennens *et al.* (2018) and Khan, Lew and Marinova (2019) found that RACAP influences innovation, with the influence of PACAP on innovation being totally mediated by RACAP. Nevertheless, Kang and Lee (2017) presented evidence to show the influence of PACAP on innovation is partially mediated by knowledge sharing and RACAP. Based on that, this study proposes the following hypotheses:

H2a: PACAP positively influences innovation;

H2b: RACAP positively influences innovation.

Given its importance to organizational performance, an organization must protect its knowledge (Manhart and Thalmann, 2015). Competitors may copy an organization's innovation if it fails to adequately ensure its knowledge is protected (Cheung *et al.*, 2012). Unwanted knowledge spillover can lead to consequences such as reputational damage and loss of revenue, among others (Ahmad *et al.*, 2014). Knowledge loss also can occur when employees retire or leave the enterprise (Jennex and Durcikova, 2013).

Organizations may adopt formal and informal mechanisms as means of knowledge protection (Olander, Vanhala and Hurmelinna-Laukkanen, 2014). Intellectual property rights (IPRs) and contracts are examples of formal mechanisms for knowledge protection (Hurmelinna-Laukkanen, 2011). Human resources practices, secrecy and tacitness are examples of informal mechanisms of knowledge protection (Gomes, Hurmelinna and Olander, 2017; Olander, Vanhala and Hurmelinna-Laukkanen, 2014). According to Gast *et al.* (2019), both formal and informal mechanisms are used to protect knowledge in collaborative relationships.

If formal knowledge protection mechanisms are in place, competitor collaboration may positively influence innovation performance (Estrada, Faems and Faria, 2016). According to the same authors, formal knowledge protection mechanisms mitigate the risk of knowledge leakage by allowing the organization to define the knowledge sharing boundaries. On the other hand, the use of formal mechanisms for knowledge protection may be understood to indicate a lack of trust and have a negative effect on knowledge sharing (Olander, Vanhala and Hurmelinna-Laukkanen, 2014; Jean, Sinkovics and Hiebaum, 2014). Knowledge protection is considered a barrier to knowledge sharing (Khamseh and Jolly, 2008), while it may also limit absorptive capacity (Ho and Wang, 2015). The same authors found knowledge protection to have a negative influence on absorptive capacity. Based on which, this research proposes the following hypotheses:

H3a: Knowledge protection negatively influences PACAP;

H3b: Knowledge protection negatively influences inter-organizational knowledge sharing;

H3c: Knowledge protection negatively influences RACAP.

Figure 1 shows the research model, considering all the hypotheses.

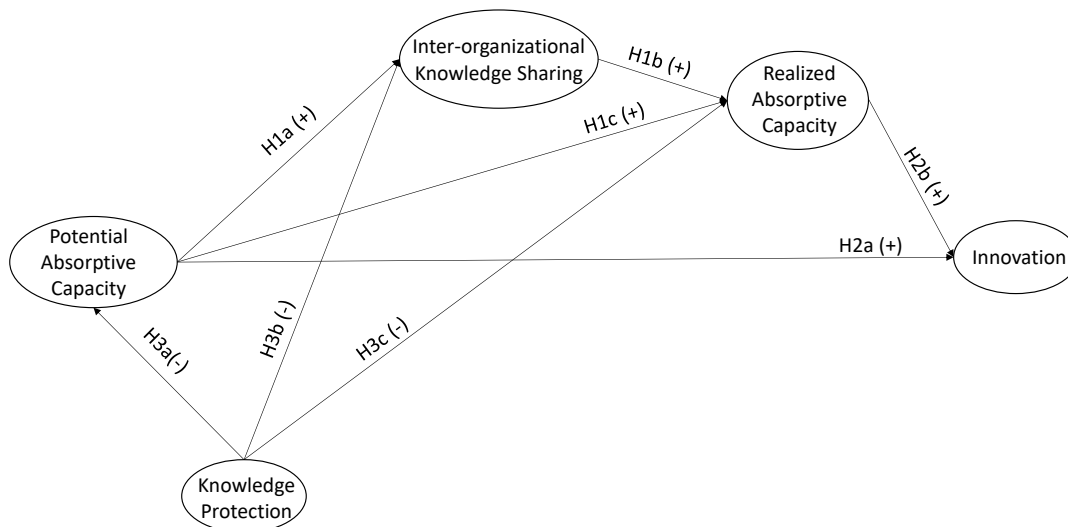


Figure 1. Research model A.

The balance between knowledge sharing, which is vital for value creation, and knowledge protection, which is essential for value appropriation, is a highly relevant issue for organizations (Foege *et al.*, 2019; Gomes, Hurmelinna and Olander, 2017; Manhart and Thalmann, 2015). According to Ritala and Hurmelinna-Laukkanen (2013), organizations simultaneously need to protect their core knowledge and acquire external knowledge. An organization may be vulnerable to unwanted knowledge leakage, especially in those contexts where knowledge sharing occurs with partners – inter-organizational knowledge sharing (Estrada, Faems and Faria, 2016). Considering this idea, knowledge protection may moderate the research model (Figure 2).

H4a,b,c,d,e: Knowledge protection moderates the relationships in the model in such a way that higher levels of knowledge protection will reduce the strength of the relationships.

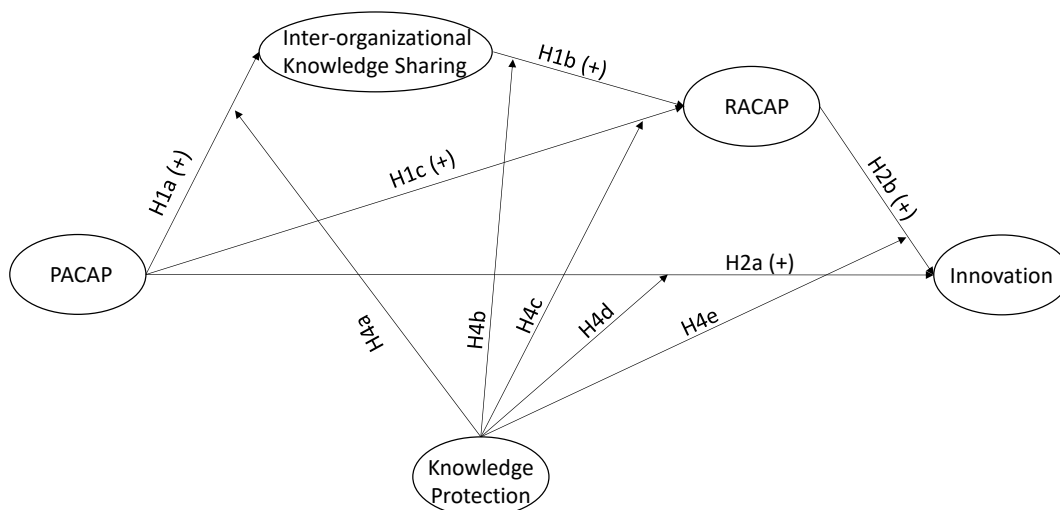


Figure 2. Research model B.

We propose to test the two models that include hypotheses that involve moderation and mediation, based on strategic management research that explores both these effects (Aguinis, Edwards and Brad-

ley, 2016). We chose to address both moderation and mediation in an attempt to uncover the underlying relationships that best stimulate innovation.

3 Method

The research method adopted in this research will be a survey. The potential respondents will be contacted via email and will be invited to participate in this research. The same e-mail will contain a link and password to access the data collection instrument. The message will be sent to a list of enterprises located in Portugal. The enterprises will be small and medium size, considering the relevance for the world economy (Marzo and Scarpino, 2016). The SMEs are defined as the European Union (2015). The questionnaire will be made available through Qualtrics®, and will be answered by one individual (owner or director) from each company.

The data will be collected using a structured questionnaire composed of two parts: 1) control variables; 2) constructs. The variables introduced to control possible confounding effects are annual revenue, number of employees, enterprise age, kind of partners (supplier, customer, competitor, government, university or research institute – he/she will choose one particularly significant partnership), business sector (industry, trade or services) and type of collaboration. The annual revenue and number of employees are used to classify the organization size. Knowledge protection is affected by number of employees and the greater the amount of knowledge the more difficult it is to protect (Liu and Deng, 2015). Old enterprises may accumulate more knowledge, but they may be less agile (Liu and Deng, 2015). Enterprises have different types of partners, such as customers, suppliers, competitors, government, universities and research institutes (Hurmelinna-Laukkanen *et al.*, 2012). The business sector will be classified as industrial (e.g. civil construction, footwear manufacturing, etc.); commercial (wholesale or retail); and services (e.g. transport, education, banking, etc.).

In this study, the constructs used will be operationalized with scales published in earlier empirical studies and the measurement items for innovation are adapted from Hussinki *et al.* (2017). This construct uses items that compare the enterprise with its main competitors in the same business sector. The scale used to measure ACAP was adapted from Lowik (2016), who used four constructs: recognition, assimilation, transformation and exploitation. To measure inter-organizational knowledge sharing, 8 items validated by Lee (2001) were adapted. The scale for inter-organizational knowledge sharing considers implicit and explicit inter-organizational knowledge. The scale for knowledge protection was adapted from Yang *et al.* (2014) - two items - and Liu and Deng (2015) – five items.

The items will be measured on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The seven-point Likert scale facilitates sensitive measurement of variance (Cooper and Schindler, 1998). The questionnaire will be improved using back translation (English-Portuguese-English), content validity (interviews with two experts) and face validity (the instrument will be applied to five potential respondents). Appendix A presents the initial version of the items.

4 Conclusion

In this study, based on a review of the literature, a research model was developed that: 1) provides new insights into inter-organizational knowledge sharing; 2) proposes potential and realized absorptive capacity are related to inter-organizational knowledge sharing and innovation; 3) deals with knowledge protection in two ways, antecedent or moderator. This study also proposed an instrument that can be used to measure the relationship between those variables, thus providing both an academic and managerial contribution. By completing this research in progress, it is hoped to contribute towards empirically demonstrating the relationship between inter-organizational knowledge sharing, absorptive capacity (potential and realized), innovation and knowledge protection.

The survey method will be adopted in the following stages of this research. In the data analysis, Structural Equation Modeling (SEM), in which the main function is the specification and estimation of linear models of the relationships between variables, will be used.

Appendix A – Constructs and items

Construct	Items
Absorptive Capacity (adapted from Lowik, 2016)	<p>PACAP:</p> <p>Recognition</p> <p>ACR1 - The employees in my company are always actively looking for new knowledge related to their work tasks.</p> <p>ACR2 - The employees in my company intentionally search for knowledge in many different domains to look “outside the box”.</p> <p>ACR3 - The employees in my company are good at distinguishing between profitable opportunities and not-so-profitable information or opportunities.</p> <p>ACR4 - The employees in my company easily identify what new knowledge is most valuable to our company.</p> <p>Assimilation</p> <p>ACA1 - The employees in my company frequently share new knowledge with colleagues to establish a common understanding.</p> <p>ACA2 - The employees in my company convey new knowledge in such a way that colleagues understand what it means.</p> <p>ACA3 - The employees in my company communicate newly acquired knowledge that might be of interest to our company.</p> <p>RACAP:</p> <p>Transformation</p> <p>ACT1 - The employees in my company often sit together to come up with good ideas.</p> <p>ACT2 - The employees in my company attend meetings with people from different departments to come up with new ideas.</p> <p>ACT3 - The employees in my company develop new insights from the knowledge available within our firm.</p> <p>ACT4 - The employees in my company can turn existing knowledge into new ideas.</p> <p>Exploitation</p> <p>ACE1 - The employees in my company often apply newly acquired knowledge in our company.</p> <p>ACE2 - The employees in my company exploit new knowledge to create new products, services, or work methods for our company.</p> <p>ACE3 - The employees in my company constantly consider how new knowledge can be applied to improve our company.</p>
Interorganizational Knowledge Sharing (adapted from Lee, 2001)	<p>Explicit</p> <p>IKSE1 - We and our partner share business proposals and reports with each other.</p> <p>IKSE2 - We and our partner share business manuals, models, and methodologies with each other.</p> <p>IKSE3 - We and our partner share each other's success and failure stories.</p> <p>IKSD4 - We and our service provider share business knowledge obtained from newspapers, magazines, journals, and television.</p> <p>Implicit</p> <p>IKSI1 - We and our service provider share know-how from work experience with each other</p> <p>IKSI2 - We and our service provider share each other's know-where.</p> <p>IKSI3 - We and our service provider share expertise obtained from education and training.</p> <p>IKSI4 - We and our service provider share each other's know-whom.</p>
Knowledge Protection (adapted from Yang <i>et al.</i> , 2014 - KP1 and KP2 - and from Liu and Deng, 2015 – KP3, KP4, KP5, KP6, KP7)	<p>KP1 – In my company, we have been able to protect our core knowledge or technologies from our partner.</p> <p>KP2 – In my company, we have been effective in preventing our core knowledge or technologies from being imitated by our partner.</p> <p>KP3 - In my company, we are able to protect our core knowledge from inappropriate use by our partner.</p> <p>KP4 - In my company, we are able to protect our core knowledge from theft by our part-</p>

	<p>ner.</p> <p>KP5 - In my company, we have extensive policies and procedures for protecting our core knowledge from our partner.</p> <p>KP6 - In my company, we protect our employees' knowledge from our partner.</p> <p>KP7 - In my company, we often emphasize the importance of protecting our core knowledge from our partner.</p>
Innovation (Hussinki <i>et al.</i> , 2017)	<p>Compared with the main competitors, in the last year my company was more innovative in...</p> <p>IN1 - Products and services for customers.</p> <p>IN2 - Methods and processes.</p> <p>IN3 - Management practices.</p> <p>IN4 - Marketing practices.</p> <p>IN5 - Business models.</p>

Table 1. Constructs and items.

ACKNOWLEDGEMENTS

We gratefully acknowledge financial support from CNPq and CAPES (Brazil), and FCT (Portugal), national funding through research grant UIDB/SOC/04521/2020.

References

- Aguinis, H., Edwards, J. R. and Bradley, K. J. (2016). "Improving Our Understanding of Moderation and Mediation in Strategic Management Research." *Organizational Research Methods* 19 (1), 1-21.
- Ahmad, A., Bosua, R. and Scheepers, R. (2014). "Protecting organizational competitive advantage: a knowledge leakage perspective." *Computers & Security* 42, 27-39.
- Alavi, M. and Leidner, D. E. (2001). "Knowledge management and knowledge management systems: Conceptual foundations and research issues." *MIS Quarterly* 25 (1), 107-136.
- Ali, I., Musawir, A. U. and Ali, M. (2018). "Impact of knowledge sharing and absorptive capacity on project performance: the moderating role of social processes." *Journal of Knowledge Management* 22 (2), 453-477.
- Ali, S., Green, P and Robb, A. (2013). "Measuring top management's IT governance knowledge absorptive capacity." *Journal of Information Systems* 27 (1), 137-155.
- Ardito, L. and Petruzzelli, A. M. (2017). "Breadth of external knowledge sourcing and product innovation: the moderating role of strategic human resource practices." *European Management Journal* 35 (2), 261-272.
- Baker, M. B. and Yousof, Z. (2017). "Factors Influencing Knowledge Sharing in Enterprise Resource Planning System Usage in Small and Medium Enterprises." *Journal of Theoretical & Applied Information Technology* 95 (8), 1693-1702.
- Balle, A. R., Steffen, M. O., Curado, C. and Oliveira, M. (2019). "Interorganizational knowledge sharing in a science and technology park: the use of knowledge sharing mechanisms." *Journal of Knowledge Management*, forthcoming.
- Božič, K. and Dimovski, V. (2019). "Business intelligence and analytics for value creation: The role of absorptive capacity." *International Journal of Information Management* 46, 93-103.
- Cheung, C., Ma, R., Wong, W. and Tse, Y. (2012). "Development of an organizational knowledge capabilities assessment (OKCA) method for innovative technology enterprises." *World Academy of Science, Engineering and Technology* 67, 54-65.
- Cohen, Wesley M.; Levinthal, Daniel A. (1990). "Absorptive capacity: A new perspective on learning and innovation." *Administrative Science Quarterly* 35 (1), 128-152.
- Cooper, D. R., Schindler, P. S. and Sun, J. (1998). *Business Research Methods*. New York: McGraw-Hill Irwin.
- Estrada, I., Faems, D. and Faria, P. (2016). "Coopetition and product innovation performance: The role of internal knowledge sharing mechanisms and formal knowledge protection mechanisms." *Industrial Marketing Management* 53, 56-65.
- European Union (2015). "User guide to the SME definition." Available at: <http://europa.eu>. Access in December/5th/2019.
- Foege, J. N., Lauritzen, G. D., Tietze, F. and Salge, T. O. (2019). "Reconceptualizing the paradox of openness: How solvers navigate sharing-protecting tensions in crowdsourcing." *Research Policy* 48, 1323-1339.
- Gast, J., Gundolf, K., Harms, R. and Collado, E. M. (2019). "Knowledge management and coopetition: How do cooperating competitors balance the needs to share and protect their knowledge?" *Industrial Marketing Management* 77, 65-74.
- Grant, Robert M. (1996). "Toward a knowledge-based theory of the firm." *Strategic Management Journal* 17 (S2), 109-122.
- Gold, A. H., Malhotra, A. and Segars, A. H. (2001). "Knowledge management: an organizational capabilities perspective." *Journal of Management Information Systems* 18 (1), 185-214.
- Gomes, J. F. S., Hurmelinna, P. and Olander, H. (2017). "HR practices, knowledge sharing and protection activities, and performance: A moderation model." *International Journal of Innovation Management* 21 (5), 1-19.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate data analysis*. 7th Edition. Upper Saddle River, NJ: Prentice Hall.

- Hair, J. F., Hult, G. T. M., Ringle, C. M., and Sarstedt, M. (2014). A primer on partial least squares structural equations modeling (PLS-SEM). Los Angeles: SAGE.
- Hess, T., Matt, C., Benlian, A. and Wiesböck, F. (2016). "Options for formulating a digital transformation strategy." *MIS Quarterly Executive* 15 (2), 123-139.
- Hooff, B. V. D. and Ridder, J. D. (2004). "Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing." *Journal of Knowledge Management* 8 (6), 117-130.
- Hurmelinna-Laukkanen, P. (2011). "Enabling collaborative innovation knowledge protection for knowledge sharing." *European Journal of Innovation Management* 14 (3), 303-321.
- Hurmelinna-Laukkanen, P., Olander, H., Blomqvist, K. and Panfilii, V. (2012). "Orchestrating R&D networks: Absorptive capacity, network stability, and innovation appropriability." *European Management Journal* 30, 552-563.
- Hussinki, H., Ritala, P., Vanhala, M., & Kianto, A. (2017). "Intellectual capital, knowledge management practices and firm performance." *Journal of Intellectual Capital* 18 (4), 904-922.
- Iivonen, I., Thalmann, S., Manhart, M. and Sillaber, C. (2018). "Reconciling digital transformation and knowledge protection: A research agenda." *Knowledge Management Research and Practice* 16 (2), 235-244.
- Jean, R.-J. B., Sinkovics, R. R. and Hiebaum, T. P. (2014). "The effects of supplier involvement and knowledge protection on product innovation in customer-supplier relationship: A study of global automotive supplier in China." *Journal of Product Innovation Management* 31 (1), 98-113.
- Jennex, M. and Durcikova, A. (2013). "Assessing knowledge loss risk." In: *Proceeding of the 46th Hawaii International Conference on System Sciences (HICSS)*, Wailea, HI, p. 3478-3487.
- Kang, M. and Lee, M.-J. (2017). "Absorptive capacity, knowledge sharing and innovative behaviour of R&D employees." *Technology Analysis & Strategic Management* 29 (2), 219-232.
- Khan, Z., Lew, Y. K. and Marinova, S. (2019). "Exploitative and exploratory innovation in emergin economies: The role of realized absorptive capacity and learning intent." *International Business Review* 28, 499-512.
- Khamseh, H. M. and Jolly, D. R. (2008). "Knowledge transfer in alliances: determinant factors" *Journal of Knowledge Management* 12 (1), 37-50.
- Kim, N. and Shim, C. (2018). "Social capital, knowledge sharing and innovation of small- and medium-sized enterprises in a tourism cluster." *International Journal of Contemporary Hospitality Management* 30 (6), 2417-2437.
- Lee, J.-N. (2001). "The impact of knowledge sharing, organizational capability and partnership quality on IS outsourcing success." *Information & Management* 38, 323-335.
- Limaj, E. and Bernroider, E. W. N. (2019). "The roles of absorptive capacity and cultural balance for exploratory and exploitative innovation in SMEs." *Journal of Business Research* 94, 137-153.
- Liu, S. and Deng, Z. (2015). "Understanding knowledge management capability in business process outsourcing." *Management Decision* 53 (1), 124-138.
- Loebbecke, C., Fenema, P. C. van and Powell, P. (2016). "Managing inter-organizational knowledge sharing." *Journal of Strategic Information Systems* 25, 4-14.
- Lowik, Sandor et al. (2016). "The team absorptive capacity triad: a configurational study of individual, enabling, and motivating factors." *Journal of Knowledge Management* 20 (5), 1083-1103.
- Manhart, M. and Thalmann, S. (2015). "Protecting organizational knowledge: A structured literature review." *Journal of Knowledge Management* 19 (2), 190-211.
- Marzo, G. and Scarpino, E. (2016). "Exploring intellectual capital management in SMEs: an in-depth Italian case study." *Journal of Intellectual Capital* 17 (1), 27-51.
- Mennens, K., Gils, A. V., Odekerken-Schröder and Letterie, W. (2018). "Exploring antecedents of service innovation performance in manufacturing SMEs." *International Small Business Journal: Research Entrepreneurship* 36 (5), 500-520.
- Najafi-Tavani, S., Najafi-Tavani, Z., Naudé, P., Oghazi, P. and Zeynaloo, E. (2018). "How collaborative innovation networks affect new product performance: Product innovation capability, process innovation capability, and absorptive capacity." *Industrial Marketing Management* 73, 193-205.

- Nodari, F.; Oliveira, M. and Maçada, A. C. G. (2016). "Organizational performance through the donation and collection of interorganizational knowledge." *VINE Journal of Information and Knowledge Management Systems* 46 (1), 85-103.
- Norman, P. M. (2002). "Protecting knowledge in strategic alliances: Resource and relational characteristics." *The Journal of High Technology Management Research* 13 (2), 177–202.
- Nooshinfard, F. and Nemati-Anaraki, L. (2014). "Success factors of inter-organizational knowledge sharing: a proposed framework." *The Electronic Library* 32 (2), 239-261.
- Olander, H., Vanhala, M. and Hurmelinna-Laukkanen, P. (2014). "Reasons for choosing mechanisms to protect knowledge and innovations." *Management Decision* 52 (2), 207-229.
- Oliveira, M., Curado, C. M., Maçada, A. C. and Nodari, F. (2015). "Using alternative scales to measure knowledge sharing behavior: Are there any differences?." *Computers in Human Behavior* 44, 132-140.
- Ritala, P., Hurmelinna-Laukkanen, P. (2013). "Incremental and radical innovation in coopetition – the role of absorptive capacity and appropriability." *Journal of Product of Innovation Management* 30 (1), 154-169.
- Wang, J., Yang, J. and Xue, Y. (2017). "Subjective well-being, knowledge sharing and individual innovation behavior: The moderating role of absorptive capacity". *Leadership & Organization Development Journal* 38 (8), 1110-1127.
- Yang, S.-M., Fang, S.-C., Fang, S.-R. and Chou, C.-H. (2014). "Knowledge exchange and knowledge protection in interorganizational learning: The ambidexterity perspective." *Industrial Marketing Management* 43, 346-358.
- Yoo, K. D., Vondereembse, M. A. and Ragu-Nathan, T. S. (2011). "Knowledge quality: antecedents and consequence in project teams." *Journal of Knowledge Management* 15 (2), 329-343.
- Zahra, S.A. and George, G. (2002). "Absorptive capacity: a review, reconceptualization, and extension." *Academy of Management: The Academy of Management Review* 27 (2), 185-203.