

Determinants of innovation performance: Exploring the role of organizational learning capability in knowledge-intensive business service (KIBS) firms

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WORKING PAPER VERSION

PLEASE CITE AS:

Lafuente, E., Solano, A., Leiva, J.C., Mora-Esquivel, R. (2019). Determinants of innovation performance: Exploring the role of organisational learning capability in knowledge-intensive business services (KIBS) firms. *Academia Revista Latinoamericana de Administración*, 32 (1), 40-62, <https://doi.org/10.1108/ARLA-10-2017-0309>

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Abstract

Purpose: This paper analyzes the relationship between organizational learning capabilities and innovation performance in organizational contexts where knowledge creation and exploitation are the business' main source of competitive advantage.

Design/methodology/approach: The study hypotheses are tested on a unique sample of 74 high-performance businesses operating in knowledge intensive business services industries (KIBS) and non-knowledge intensive sectors for 2016. The study employs a sequential deductive triangulation analysis (QUAN → qual) based on linear regression models and qualitative interviews.

Findings: The results indicate that organizational learning capabilities positively impact innovation performance. Additionally, the findings reveal that this relationship is stronger in organizations—KIBS firms—where knowledge creation and exploitation constitute the main source of competitive advantage.

Research limitations/implications: This paper offers insights on how the outcomes of organizational learning capabilities, in terms of innovation, are heterogeneous across industries. This study contributes to a better understanding of the conditions under which the effects of developing learning-enhancing strategies occur in businesses operating in different industries.

Practical implications: Both knowledge generation and exploitation processes are critical for business success, and organizational learning capabilities play a decisive role in this process. In this sense, the results suggest that managers need to turn their attention to the characteristics of business operations when considering the development of strategies aimed at enhancing organizational learning capabilities.

Originality/value: The paper further explores the influence of organizational learning capabilities on innovation performance by analyzing how organizational learning strategies interact with relevant organizational characteristics—that we link to the exploitation of knowledge-based resources—to yield superior innovation performance.

Keywords: Innovation performance, organizational learning capability, knowledge-intensive business services, KIBS, Costa Rica

Paper type: Research paper

Determinantes del desempeño innovador: Explorando el papel de las capacidades de aprendizaje organizativo en empresas de servicios intensivos en conocimiento (KIBS)

Abstract

Purpose: Este trabajo analiza la relación entre capacidades de aprendizaje organizativo y desempeño innovador en contextos organizacionales donde tanto la creación como la explotación de conocimiento constituyen la principal fuente de ventaja competitiva de las empresas.

Design/methodology/approach: Para la verificación empírica de las hipótesis planteadas en este trabajo se emplea una base de datos del 2016 que incluye información de 74 empresas ‘gacela’ que operan en sectores de servicios intensivos en conocimiento (KIBS) y en industrias no intensivas en conocimiento. El estudio utiliza un análisis de triangulación secuencial deductiva (QUAN → qual) basado en modelos de regresión lineal y entrevistas en profundidad de corte cualitativo.

Findings: Los resultados indican que las capacidades de aprendizaje organizativo impactan positivamente el desempeño innovador. Además, los resultados revelan que esta relación es más pronunciada en empresas—empresas KIBS—donde la creación y la explotación de conocimiento son la principal fuente de ventaja competitiva.

Research limitations/implications: Este trabajo ofrece resultados sobre la heterogeneidad de los rendimientos de las capacidades de aprendizaje organizativo, en términos de innovación. Además, este estudio contribuye a un mejor entendimiento de las condiciones bajo las cuales la implantación de estrategias orientadas a mejorar el aprendizaje organizacional se materializa en un mayor desempeño innovador en empresas que operan en distintos sectores económicos.

Practical implications: Tanto la creación como la explotación de conocimiento son procesos clave para el éxito empresarial, y las capacidades de aprendizaje organizativo juegan un papel fundamental en este proceso. En este sentido, los resultados del estudio sugieren que los directores y gestores de empresas deben tener en consideración las características de los procesos operativos de sus empresas a la hora de diseñar e implementar estrategias que buscan mejorar las capacidades de aprendizaje organizativo al interior de la empresa.

Originality/value: Este trabajo investiga en profundidad el efecto de las capacidades de aprendizaje organizativo sobre el desempeño innovador mediante un análisis que busca explicar cómo las estrategias de aprendizaje organizativo interactúan con importantes características de la empresa—las cuales asociamos a la explotación de recursos basados en conocimiento—para generar mayores niveles de desempeño innovador dentro de la empresa.

Keywords: Desempeño innovador, capacidades de aprendizaje organizativo, servicios intensivos en conocimiento, KIBS, Costa Rica

Paper type: Research paper

Determinants of innovation performance: Exploring the role of organizational learning capability in knowledge-intensive business service (KIBS) firms

1. Introduction

Innovations are decisive to the long-term sustainability of firm-level strategies and the success of businesses (Lafuente *et al.*, 2018; Lucas and Ferrell, 2000; McDermott and O'Connor, 2002). The complexity of the business environment, often associated to rapid technological progress and market globalization, has increased the relevance of knowledge acquisition and creation processes, as well as of innovation processes (Herrmann, 2005). Furthermore, since the seminal work by Schumpeter (1934)—who conceptualizes entrepreneurship as a special economic function that sparks development by promoting entrepreneurship-driven innovations that create new combinations of inputs and outputs (Schumpeter, 1934, p. 66)—the analysis of organizational renewal has increasingly drawn scholarly attention, and innovation has gradually become a central element of business competitiveness (Dobni, 2008; Ketelhohn and Ogliastri, 2012).

At the business level, innovation has been conceptualized as an organizational capability that can have a significant impact on performance (Crossan and Apaydin, 2010). Innovation performance (IP) has been linked to various business outcomes, including products, operational processes, customer orientation (markets) and the organizational structure (Garcia and Calantone, 2002; Linton, 2009; Gunday *et al.*, 2011). Furthermore, IP represents both the degree of success achieved—i.e., the effectiveness of an innovation—and the efforts made to achieve that success that become evident via the commercialization of such innovations (Alegre and Chiva, 2005).

Nevertheless, businesses do not materialize the generally positive effects of their innovative efforts at the same intensity. Prior research has identified various drivers of innovation, being underlined the connection between organizational learning capabilities (OLC) and IP (Chiva and Alegre, 2009; Crossan and Apaydin, 2010; Lafuente *et al.*, 2018). In this sense, innovation is conceptualized as the individual and collective learning processes that take place within the business, thus reinforcing the role played by OLC as facilitators of knowledge creation and diffusion (dos Santos and Santos, 2014; Fernández *et al.*, 2012; Kamasak *et al.*, 2016).

Innovation has been associated with the firms' learning abilities, and with the concept of 'learning organizations' in which innovation is conceived as a learning cycle involving the mobilization and management of knowledge that facilitate the development of innovative solutions and, consequently, superior performance levels (Tidd *et al.*, 2005, p. 502). Therefore, the design of

strategies that encompass learning orientation is critical to enhance the relationship between OLC and IP (Alegre and Chiva, 2008; Fernández *et al.*, 2012).

However, the outcome of innovative initiatives may vary across firms. In this study we pay special attention to the potentially differentiating IP outcomes of archetypal knowledge-based businesses, namely knowledge-intensive business services (KIBS) firms, relative to those reported by businesses operating in other industries.

During the last decade KIBS businesses have increasingly attracted academic attention (see, e.g., Horváth and Rabetino, 2018; Lafuente *et al.*, 2018; Lafuente *et al.*, 2010; Wyrwich, 2018). We argue that, among others, two factors—linked to the economic potential of KIBS firms and to the characteristics of the value-added that these firm generate—can explain the rise of scholarly research focused on the analysis of KIBS businesses.

Concerning the first aspect (economic potential of KIBS firms), KIBS businesses are critical economic agents that are conceptualized as carriers of knowledge that facilitate the development of innovation processes (Lafuente *et al.*, 2010; Wyrwich, 2018). In parallel with the call made by public administrations (e.g., European Commission, 2012), scholars have suggested that the development of a solid knowledge-based service sector can contribute to create/enhance manufacturers' product-service systems (PSSs) (Bustinza *et al.*, 2018). Also, the economic potential of KIBS firms is not limited to business-specific effects (Lafuente *et al.*, 2018; Vendrell-Herrero *et al.*, 2017). Existing research shows that the economic potential of KIBS businesses surpasses organizational boundaries, and that KIBS firms contribute to generate important territorial outcomes related to enhanced regional innovation systems and superior manufacturing productivity (Arnold *et al.*, 2016; Horváth and Rabetino, 2018; Lafuente *et al.*, 2017; Wyrwich, 2018).

In the case of the second aspect (type of value generated by KIBS), it should be noted that KIBS firms are primarily concerned with the provision of knowledge-intensive services—either professional (e.g., consultancy services) or technical (e.g., R&D development or information technology)—that constitute inputs to the operational processes of other businesses (e.g., Horváth and Rabetino, 2018; Lafuente *et al.*, 2017). Because the production function of KIBS firms is characterized by the exploitation of knowledge-based inputs and their economic activity takes place in business-to-business (B2B) settings, the competitive advantage of KIBS firms primarily relies on the development and commercialization of knowledge-based services (Lafuente *et al.*, 2018).

Therefore, innovation performance is a crucial aspect of KIBS' operations (Lafuente *et al.*, 2010; Lafuente *et al.*, 2018; López-Sánchez and Santos-Vijande, 2016). Additionally, the relevance of KIBS firms relies in their capacity to channel their innovations to the market. Recent studies show that the KIBS firms contribute to transfer specific knowledge and technologies with value-

adding potential to other businesses mostly operating in manufacturing sectors (Bigdeli *et al.*, 2018; Bustinza *et al.*, 2017). Perhaps because innovation is inherently conceived as a key success factor of KIBS firms, the analysis of the relationship between OLC and IP in KIBS businesses has been largely sidelined in previous studies (Castaldi *et al.*, 2013; Lafuente *et al.*, 2018).

This is the focus of this study. More concretely, this paper analyzes the relationship between OLC and IP in KIBS firms, where knowledge creation and exploitation are their main source of competitive advantage. The empirical application uses a sequential methodological triangulation approach (QUAN → qual) (Morse, 2001) on a sample of 74 Costa Rican high performance firms. The first stage (quantitative analysis) examines the impact of OLC on IP through linear regression models (OLS), while in the second stage (qualitative analysis) we conducted in-depth conversations about the OLC processes and the IP-related decision-making in four firms included in the sample. The main results of the study indicate that OLC positively influence IP. Also, the findings show that the positive relationship between OLC and IP is significantly stronger in businesses whose competitive advantage is directly associated with the exploitation of knowledge-based resources, that is, in KIBS businesses.

The proposed analysis of innovation patterns in different organizational settings contributes to the strategic management literature by increasing our understanding on how strategies designed to create and/or develop organizational learning capabilities impact innovation performance, and on how these strategies interact with relevant operational and organizational characteristics—that we link to the exploitation of knowledge-based resources—to yield superior innovation performance.

The article is structured as follows. Section 2 presents the theoretical background and the study hypotheses. In section 3 the sample, variables and the method are presented. Empirical results are found in Section 4, while the final section provides the discussion and concluding remarks.

2. Background theory and hypotheses

2.1 Organizational learning capabilities and innovation performance

Organizational learning capabilities (OLC) have been conceptualized as the ability of a business to create or acquire, transfer and integrate knowledge. This implies a knowledge exploitation process that potentially constitutes a source of sustainable competitive advantage which, in turn, may yield to superior performance and better organizational strategy making (Alegre and Chiva, 2008; Bagnoli and Vedovato, 2014).

The mechanisms by which OLC is generated within the business is integrated by five dimensions (Chiva *et al.*, 2007; Fernández *et al.*, 2012): experimentation, that is, tests for the generation of new ideas or projects, which leads to the search for innovative solutions to possible

problems; risk taking, linked to new learning processes that require a tolerant business that recognizes the possibility of failure; interaction with the external environment to facilitate the integration of new market developments into the business; dialogue between team members, which increases the capacity to generate ideas and promote communication and, finally; participatory decision-making, which allows workers to access better information and achieve higher levels of involvement and commitment.

Literature portrays learning orientation as one of the firm's characteristics that functions as an antecedent to innovation (Hult *et al.*, 2004; Hurley and Hult, 1998). Also, Cantalone *et al.* (2002) offered empirical evidence that learning orientation influences innovation, and proposed viewing innovation as a broad process of learning that enables the implementation of new ideas, products and processes. The argument is in line with Nonaka and Takeuchi (1995) who stress that the process of innovation is, in part, a process of learning and creation of new knowledge. In this study, innovation performance is operationalized as the capacity of businesses to create an interaction between internal knowledge and the demands of external agents (market) (Alegre *et al.*, 2013). This innovation-driven effort will materialize in significant modifications of the business offering (products/services), and in greater market shares in foreign and domestic markets.

Prior research has shown that the presence of OLC positively impact IP (Alegre and Chiva, 2013; Fernández *et al.*, 2012; Jiménez and Sanz, 2006; Kamasak *et al.*, 2016; Tohidi and Mandegari, 2012). The link between OLC and IP comes from the observation and action of the context, efforts in the development of products or services and the results of practices and skills that drive innovation (Calantone *et al.*, 2002; Gomes and Mate, 2017). OLC are associated with innovation performance as the way in which knowledge is created, acquired, used and shared, which impacts the innovation of processes, products or services to achieve a competitive advantage (Fernández *et al.*, 2012). Therefore, we hypothesize:

H1: *Organizational learning capabilities have a positive impact on innovative performance*

2.2 Innovation performance in knowledge-intensive business services (KIBS) firms

Knowledge-intensive service activities are increasingly recognized as one of the main engines for the consolidation of knowledge-based economies (Arnold *et al.*, 2016; Horváth and Rabetino, 2018; Lafuente *et al.*, 2017). The demand of knowledge-based services is growing with the efforts of economies to enhance their competitive position, and this is especially evident in manufacturing sectors which have strong incentives to involve external agents (KIBS) in order to introduce value-adding services into their operations (Cusumano *et al.*, 2015). The market and

economic relevance of knowledge-intensive service businesses has translated into increased academic research (see e.g., Arnold *et al.*, 2016; Jacobs *et al.*, 2016; Lafuente *et al.*, 2017).

KIBS firms are defined as businesses that focus on creating, accumulating and exploiting technical knowledge for the generation of customized services with a professional—e.g., consultancy, legal and accounting services—or a more technical—e.g., R&D development, technical testing, and information technology—orientation (Lafuente *et al.*, 2018). KIBS mostly provide knowledge-intensive inputs to the business processes of other firms or offer solutions to meet (corporate) customer needs (Horváth and Rabetino, 2018; Muller and Doloreux, 2009).

Because their economic activity is mostly developed in business-to-business (B2B) settings, KIBS depend heavily on the growth of their corporate customers (Figueiredo *et al.*, 2017; Horváth and Rabetino, 2018; Lafuente *et al.*, 2018). Other distinctive elements of these firms are that they compete in certified knowledge, offer services of high quality and complexity, and require highly talented and skilled employees who have the capacity to respond to the needs of customers and the environment (Dávila and Elvira, 2010; López- Sánchez and Santos-Vijande, 2016). The economic relevance of KIBS firms becomes evident when we look at their increased presence in strategic sectors, such as pharmaceutical, biotechnology and information technology (Dahiyat, 2015).

In the context of KIBS businesses—i.e., their competitive advantage is primarily driven by the exploitation of knowledge-based inputs—innovation is critical to the performance of these businesses and of their customers who demand high-quality services that respond to changing market conditions (Castaldi *et al.*, 2013, Dahiyat, 2015, López-Sánchez and Santos-Vijande, 2016). KIBS are recognized for their essential component of innovation (Figueiredo *et al.*, 2017; Lafuente *et al.*, 2017), which can be enhanced by increasing innovation budgets and resources, accessing relevant information about markets and customer needs, and using technology to develop soft skills (Muller and Doloreux, 2009).

Innovation processes in KIBS typically have distinctive features (Lafuente *et al.*, 2017), including: longer response times, since it implies more specialization in deliverables; the consideration of supply and demand effects; intense and frequent interaction with customers; an organizational structure that enhances innovation; adequate change management practices; the presence of processes that protect information and knowledge, such as intellectual property; and the pursuit of knowledge codification so that it can be used in future operations.

Innovation performance is not only critical for the success of KIBS firms, but also extrapolates to businesses in other sectors collaborating with KIBS, which increasingly seek to implement innovative strategies through adding services to their product offering (Bigdeli *et al.*, 2018; Muller and Doloreux, 2009). This strategy based on the integration of advanced services into

the customer's product offering—i.e., product-service solutions—is referred to as business servitization (Bustinza *et al.*, 2018; Cusumano *et al.*, 2015; Vendrell-Herrero *et al.*, 2017).

For example, in their analysis of 370 manufacturing multinationals (MMNEs), Bustinza *et al.* (2017) find that the adoption of strategic partnerships with KIBS moderates the relationship between product-service innovation and business performance. Additionally, Bigdeli *et al.* (2018) employ qualitative research to analyze the importance of strategic partnerships with KIBS in the UK road transport industry. The authors identify how a newly created KIBS firm is changing the power dominance in the supply chain of the sector and is enhancing value for incumbent firms, especially for truck operators that increase their operating efficiency by using the technology delivered by the KIBS. This evidence suggests that the innovation performance of KIBS firms goes beyond the organizational boundaries.

In short, the economic potential of KIBS' operations is conditional on their capacity both to effectively create knowledge and innovations and to commercialize their innovations via interactions with their corporate clients (Horváth and Rabetino, 2018; Lafuente *et al.*, 2017). From this theory and empirical evidence the following hypothesis emerges:

H2: *Innovation performance is greater among knowledge-intensive business services firms*

2.3 The relationship between organizational learning ability and innovative performance in knowledge-intensive enterprises

Prior studies have found superior IP levels in KIBS businesses (Dahiyat, 2015; Figueiredo *et al.*, 2017; López-Sánchez and Santos-Vijande, 2016). Additionally, Zieba and Zieba (2014) report a stronger positive association between leadership and IP in KIBS firms, where management leadership fosters knowledge and establishment of new innovative actions. Cho *et al.* (2013) find a positive relationship between organizational learning capabilities and culture development in KIBS firms. This culture includes innovation within its conceptualization, where the members of the business are open-minded, flexible and oriented towards obtaining specialized knowledge, are not afraid to face new challenges or to adapt and make transitions of their line of products or services to respond or anticipate market demands with quality.

Knowledge is one of the key resources that characterize businesses, which determines the capabilities and scope of the firm, explaining why KIBS firms are more innovative (Lafuente *et al.*, 2018). Because the core activity of KIBS firms is to develop, adapt and commercialize knowledge, organizational learning capabilities play a crucial role in these processes. Skjølvsvik *et al.* (2007) and Castaldi *et al.* (2013) suggest that KIBS' innovation performance depends on their organizational learning capabilities.

The strategy making of KIBS firms is primarily driven by the efficient selection of clients and to the identification of knowledge development opportunities (Skjølsvik *et al.*, 2007). While the former dimension is linked to the maximization of successful value co-creation processes with customers (Kohtamäki and Partanen, 2016; Vendrell-Herrero *et al.*, 2017), the latter emphasizes the need to enhance the knowledge-based resources of the business. Because of its relevance for developing a solid knowledge base that ensures adaptability and success in the long term, we focus on the knowledge dimension of KIBS' strategy making.

The knowledge dimension—which is strongly linked to innovativeness defined as the pursuit of creative or novel solutions (Knight, 1997)—is more strategic and has a greater long-term impact on KIBS performance. In this sense, organizational learning capabilities—i.e., the ability of the business to create or acquire, transfer and integrate knowledge (Chiva *et al.*, 2007)—may play a critical role by channeling the efforts by managers and employees for creating valuable knowledge with economic potential to customers in co-production processes.

The specific operational characteristics of KIBS businesses—i.e., emphasis on knowledge exploitation, the provision of value-adding customized services, and frequent interaction with customers—encourage the adoption of innovative initiatives to generate new knowledge necessary to create/expand their customer base and, consequently, develop a sustainable competitive advantage in the long run (Lafuente *et al.*, 2010). We argue that organizational learning capabilities are decisive for enhanced innovation performance and that this is especially evident in businesses (KIBS) with strong incentives both to accumulate knowledge—a prerequisite of organizational capabilities (Lafuente *et al.*, 2018)—and to develop and commercialize innovations (Bustinza *et al.*, 2017). Therefore, we hypothesize:

H3: *The positive relationship between organizational learning capabilities and innovation performance is stronger in knowledge-intensive business services (KIBS) firms*

3. Data, variable definition and method

3.1 Data

According to official records made available by the Costa Rican Central Bank, 355 high-performance businesses (in terms of productivity, sales or employment) operated in the country in 2015. The unit of analysis of this study is the high-performing business, and the questionnaire employed in this work was designed specifically for the purposes of this research, that is, to evaluate the innovation performance of Costa Rican high-performance businesses. Data collection was achieved through self-administrated, structured interviews where the entrepreneur or the manager was asked to answer essentially closed questions. The questionnaire for the survey was

applied by a professional market research consulting firm. It should be kept in mind that, following the practice recommended in the literature (Colton and Covert, 2007), the questionnaire was also subject to a pre-test—i.e., two scholars and two managers evaluated the instrument—in order to correct potentially misleading or confusing questions.

The information was collected between August and November 2016. Also, the research team leading the investigation (Costa Rica Institute of Technology) offered a feedback report on the survey results to the participating firms in order to encourage firms to answer. The final dataset includes information for 74 high-performance businesses operating in Costa Rica, which represents a response rate of 20.85%. The response rate of this study is in line with the results reported by prior work in social science literature. In their comprehensive analysis of the quality of data-collection procedures in 285 scientific articles, Chidlow *et al.* (2015) found that the typical response rate ranges between 20% and 40%.

Looking at the geographic distribution of the sampled businesses, we note that 48.65% of businesses are located in the capital (San José), 17.57% are headquartered in the province of Alajuela, while 8.11% of businesses are located in the provinces of Heredia, Guanacaste and Puntarenas. The provinces with the lowest representation in the final sample used in this study are Cartago (5.41%) and Limon (4.05%).

Figures for the year 2017 made available by the Costa Rica Institute of Statistics (INEC: <http://www.inec.go.cr/economia/directorio-de-empresas-y-establecimientos-0>) reveal the following geographic distribution of businesses across provinces: 39.56% of businesses were located in San José, 20.98% in Alajuela, 13.21% in Heredia, 9.93% in Cartago, 7.08% in Puntarenas, 4.94% in Guanacaste, and 4.31 in Limon. Therefore, the territorial composition of the sampled businesses mostly follows the geographic distribution of businesses in the country. Additionally, the geographic spread of the sampled high-performance firms is similar to that reported by Monge *et al.* (2017) for the population of high-performance businesses in Costa Rica in 2012.

3.2 Variable definition

Innovation performance. In this study, the dependent variable is measured following the Oslo Manual scale for evaluating the results of product/service innovation (OECD, 2005). Eight variables coded on a 7-point Likert scale (1= very poor and 7= excellent) were used to operationalize the innovation performance construct: 1) replacement of products being phased out, 2) extension of product range within main product field through technologically new products, 3) extension of product range within main product field through technologically improved products, 4) extension of product range outside main product field, 5) development of environment-friendly

products, 6) market share evolution, 7) opening of new markets abroad, and 8) opening of new domestic target groups. Note that the proposed approach to measure innovation performance has been used in previous studies (see, e.g., Alegre and Chiva, 2008; Alegre *et al.*, 2013; López-Cabrales *et al.*, 2009).

Factor analysis was employed to verify the capacity of the eight (observed) variables to reflect the (latent) innovation performance construct. The results indicate that the eight variables fall into one factor that captures innovation performance (Eigenvalue: 5.6754, proportion of variance explained: 0.7094). As for the goodness of fit statistics, the result of the Kaiser-Meyer-Olkin (KMO) index of sampling adequacy is above the recommended cut-off point of 0.50 (0.7505), corroborating that the sample is factorable. The results of the reliability test (Cronbach's Alpha) for the factor obtained is 0.9405, confirming that the construct extracted from the factor analysis is internally consistent across items to measure the underlying concept under evaluation (innovation performance). These results confirm that our approach based on factor analysis to measure innovation performance is robust (Nunnally and Bernstein, 1994).

Organizational learning capability. To operationalize OLC we use the scale developed by Chiva *et al.* (2007). We employ 14 items coded on a 7-point Likert scale (1= strongly disagree and 7= strongly agree) to measure organizational learning capability: 1) people here receive support and encouragement when presenting new ideas, 2) initiative often receives a favorable response here, so people feel encouraged to generate new ideas, 3) people are encouraged to take risks in this business, 4) people here often venture into unknown territory, 5) it is part of the work of all staff to collect, bring back, and report information about what is going on outside the company, 6) there are systems and procedures for receiving, collaborating and sharing information from outside the company, 7) people are encouraged to interact with the environment: competitors, customers, technological institutes, universities, suppliers etc., 8) employees are encouraged to communicate, 9) there is a free and open communication within my work group, 10) managers facilitate communication, 11) cross-functional teamwork is a common practice here, 12) managers in this business frequently involve employees in important decisions, 13) policies are significantly influenced by the view of employees, and 14) people feel involved in main company decisions. As in the case of the innovation performance variable, we used factor analysis to compute the factor scores of the latent variable linked to organizational learning capability.

In our sample, the 14 variables are grouped into one factor with an eigenvalue greater than unity (Eigenvalue: 9.6361, proportion of variance explained: 0.6883). In this case, the value of the Kaiser-Meyer-Olkin (KMO) statistic is 0.8395, while the result of the Cronbach's Alpha is 0.9629.

Once more, the results confirm both the internal consistency of the extracted construct across the 14 items linked to organizational learning capability and the validity of the proposed factor analysis.

Convening knowledge-intensive business services (KIBS). Knowledge-intensive services businesses are innovation bridges that interplay with other economic agents acting as purchaser, provider or partner (Lafuente *et al.*, 2017), thus implying an in-depth interaction between KIBS businesses and the end user (Cusumano *et al.*, 2015). One example of services provided by KIBS is the management of large samples of digital information, namely big data. Opresnik and Taisch (2015) show that this service adds significant value to manufacturers' offering especially in B2B relationships by providing customers with tools that can be used to enhance cost saving policies and develop more informed strategic decision-making processes. KIBS firms show a distinctive way to access, create and integrate knowledge in their processes (Jacobs *et al.*, 2016; Lafuente *et al.*, 2010).

According to the European Commission (2012), KIBS encompasses a wide range of activities including those related to computing and information and communication technologies (NACE Rev-2: 62), architectural and engineering technical services (NACE Rev-2: 71), research and development (NACE Rev-2: 72), as well as business-oriented services (NACE Rev-2: 69, 70, 73 and 78)—i.e., legal and accounting and auditing services, management consultancy, advertising and market research—and other knowledge-oriented services (NACE Rev-2: 74). In the questionnaire interviewees were asked to detail the main activity of their firm, according to the previous classification, to categorize KIBSs and non-KIBSs firms. The descriptive statistics in Table 1 show that 33.78% of the sampled high-performance businesses operate in KIBS sectors. The rest of businesses operate in retailing sectors (27.03%), consumer-oriented services (16.22%), construction activities (13.51%), manufacturing sectors (5.41%), and non knowledge-intensive service sectors (4.05%).

--- Insert Table 1 about here ---

Control variables. We control for business size, age and location in the different model specifications. Business size is measured through the number of employees, while business age is expressed in years of market experience. In our sample, businesses report, on average, 80.80 employees, while average market experience is 16 years. Finally, we introduce a set of dummy variables to account for potential territorial effects (in all models San José is the omitted dummy province variable). In all model specifications, the variables business size and firm age are logged to reduce skewness.

3.3 Methods

Although the proposed hypotheses are testable through common quantitative techniques we resort to methodological triangulation (Greene *et al.*, 1989). More concretely, in this study we employ sequential methodological triangulation (QUAN \rightarrow qual) (Morse, 2001) to ensure a more comprehensive analysis of the main nuances of innovation performance in KIBS and non-KIBS firms (Morse and Niehaus, 2009). The deductive methodological triangulation “is the use of at least two methods, usually quantitative and qualitative to address the same research problem” (Morse and Niehaus, 2009, p. 120). The main advantage of the sequential triangulation approach is to raise accuracy of information and to generate a more holistic picture of the phenomenon analyzed (Bryman and Bell, 2015).

In the first stage of the sequential methodological triangulation we examine the impact on innovation performance (IP) of organizational learning capabilities (OLC) in KIBS and non-KIBS firms through linear regression models (OLS). The final model used to test the proposed hypotheses empirically has the following form:

$$\text{Innovation performance}_i = \beta_0 + \beta_1 \text{OLC}_i + \beta_2 \text{KIBS}_i + \beta_{12} \text{OLC} \times \text{KIBS}_i + \beta_3 \text{Control variables}_i + \varepsilon_i \quad (1)$$

In equation (1), innovation performance is the linear prediction computed from the factor analysis described in section 3.2, β_0 is the intercept, β_j is the set of parameter estimates computed for the j th independent variable, and ε_i is the normally distributed error term. Additionally, OLC is the organizational learning capability variable measured as the linear prediction generated by the factor analysis (section 3.2). Control variables include business size, firm age, and the set of territorial dummies.

In terms of our hypotheses, we expect that $\beta_1 > 0$ to confirm that OLC positively impacts IP (**H1**). Hypothesis 2 (**H2**) will be confirmed if the coefficient linked to the KIBS businesses is positive and statistically significant ($\beta_2 > 0$). The parameter estimate for the interaction term between OLC and the KIBS dummy (β_{12}) will be used to test our hypothesis **H3**. In this case, we expect that $\beta_{12} > 0$ and $\beta_{12} > \beta_1$ to confirm our third hypothesis that proposes that the positive impact of OLC on IP is stronger in the case of KIBS firms.

To better understand ‘how’ OLC benefits IP in KIBS and non-KIBS firms, it is useful to complement the ‘what’ of our study’s causal variance-based model with a more qualitative process analysis (Van de Ven, 2007). Underlying our quantitative variance model (equation (1)) is the theoretical presumption that the specific operational and organizational characteristics of KIBS

firms shape the way in which OLC encourages IP. To find out how this process may be engendered by OLC (input) and lead to greater IP (output), we specifically analyzed the decision making that connects the input-output link identified in the variance model described in equation (1).

To do so we have undertaken the second step of the proposed sequential deductive triangulation approach (Morse, 1991) by conducting in-depth conversations about the OLC processes and the IP-related decision-making of KIBS and non-KIBS firms. While the information for the quantitative analysis was collected between August and November 2016, the interviews with entrepreneurs/managers were conducted between May 4th and May 14th 2018.

Following the methodological design of this method, we have contacted four businesses included in the sample used in the study. The four cases for the qualitative analysis were selected based on their appropriateness for the studied objectives rather than randomness (Greene *et al.*, 1989). Therefore, the studied entrepreneurs/managers were deliberately chosen from a purpose-based premise to highlight the contrast of the different potential scenarios analyzed in our model: KIBS and non-KIBS businesses with different levels of organizational learning capabilities, and KIBS and non-KIBS businesses with different levels of innovation performance.

4. Results

This section presents the empirical findings of the study. Results in section 4.1 quantitatively test the proposed hypotheses by using the OLS model presented in equation (1). Section 4.2 adopts a qualitative approach to analyze how organizational learning capabilities contribute to innovation performance in KIBS and non-KIBS firms.

4.1 Quantitative analysis: Regression results

This section presents the results of the empirical analysis. To evaluate the threat of collinearity, we computed the average inflation factor (VIF) for all independent variables. In all model specifications presented in Table 2, the average VIF values are below the commonly used cut-off threshold of ten. The results for this diagnostic test do not raise collinearity concerns.

Additionally, we ran the Jarque-Bera test to verify whether the errors computed from the different regression models follow a normal distribution (Jarque and Bera, 1987). Based on the results for the three models in Table 1 (Model 1: $\chi^2=0.9879$, chi2-value = 0.6102, Model 2: $\chi^2=0.9719$, chi2-value = 0.6151, Model 3: $\chi^2=0.9807$, chi2-value = 0.6124), we conclude that error terms linked to our models are normally distributed, thus verifying the validity of our approach.

Concerning the findings of the study, regression results in Table 2 show that the positive impact of OLC on IP is consistent across model specifications. This result is in line with prior work

(Alegre *et al.*, 2013; Alegre & Chiva, 2013; Jiménez and Sanz, 2006; Kamasak *et al.*, 2016; Tohidi and Mandegari, 2012), and gives support to our first hypothesis (**H1**) that proposes a positive relationship between OLC and IP.

--- Insert Table 2 about here ---

The second hypothesis states that, because of their distinctive operational characteristics and incentives to engage in innovation actions (Horváth and Rabetino, 2018; Lafuente *et al.*, 2017), KIBS firms show superior innovation performance levels, compared to businesses in other industries. The findings in columns 2 and 3 of Table 2 do not give support to this hypothesis (**H2**). This result contrasts recent studies on the innovative capacity of KIBS firms (Bigdeli *et al.*, 2018; Bustinza *et al.*, 2017; Lafuente *et al.*, 2017). Also, a further scrutiny of the data reveals that the estimated IP level of KIBS is not significantly different from that reported by businesses in other industries (t -test = -0.7491 and p -value = 0.46). Therefore, the result pointing to a non-significant effect of KIBS on innovation performance should be taken with a grain of salt as it may reveal that, when the analysis is strictly focused on high-performing businesses, KIBS and non-KIBS firms may reach similar levels of innovation performance.

Concerning the model estimating the moderating effect of KIBS firms in the relationship between OLC and IP, results in model 3 underline the relevance of KIBS businesses. The findings suggest that the positive effect of OLC on IP is more prevalent among KIBS firms.

To aid in the interpretation of the results, we plot the interaction terms between the KIBS dummy and the organizational learning capability variable based on estimates from model 3 (equation (1)). The results are presented in Figure 2. In the figure, the vertical axis indicates the values of the organizational learning capability, while the horizontal axis indicates the estimated level of innovation performance. Control variables are set at their sample means.

Figure 2 graphically illustrates that the relationship between OLC and IP is positive for both KIBS and non-KIBS businesses. Although the slope of both estimated effects is positive, the figure shows how the positive relationship between OLC and IP is steeper for the group of KIBS businesses. That is, the effect of OLC is higher among KIBS businesses, compared to firms operating in other industry sectors.

To corroborate this result, we tested if the coefficients linked to OLC and the interaction terms between OLC and the KIBS dummy have the same significant influence on IP. The result of the F-test indicates that both coefficients are significantly different (F-test = 2.89 and p -value =

0.0423). Therefore, we find support for our third hypothesis (**H3**) that proposes that the positive relationship between OLC and IP is stronger among KIBS businesses.

--- Insert Figure 1 about here ---

At this point it is worth mentioning that we conducted a robustness check based on a structural equation model to further confirm the validity of the empirical findings presented in this section. The partial least squares structural equation model (PLS-SEM) is the methodological tool chosen. This method—originally proposed by Lohmöller (1989) and Wold (1994) and further developed by Esposito Vinzi *et al.* (2010) and Hair *et al.* (2014)—has gained increased popularity because it provides researchers much more flexibility regarding the handling of various estimation issues (e.g., modeling of non-linear relationships and treatment of missing data) (Hair *et al.*, 2013). Additionally, PLS-SEM is particularly advantageous when a small sample is used to model the relationships of interest, in terms of estimation robustness (Hair *et al.*, 2017).

Following equation (1), the coefficients of the PLS-SEM model—estimated using the software SmartPLS 3.0 (<http://www.smartpls.com>)—are presented in Table A1 of the Appendix. In line with the findings reported in column 3 of Table 2, the results of the PLS-SEM corroborate that organizational learning capabilities has a direct positive impact on innovation performance. We also found that the relationship between KIBS and innovation performance is stronger among KIBS firms with high levels of organizational learning capabilities (OLC). Finally, it should be noted that, contrary to the OLS model presented in Table 2, the coefficient for the variable business age is not significant in the PLS-SEM.

The objective of this analysis was to show that our empirical results are robust to different estimation methods. The core findings of this exercise further validate the interpretations that emerge from the OLS models presented above in this section.

4.2 Qualitative analysis

The qualitative analysis is based on in-depth interviews with four entrepreneurs/managers, each of them representing one of the relevant groups for this study on IP: KIBS and non-KIBS firms with different (low and high) self-reported levels of IP, and businesses (KIBS and non-KIBS) with different (low and high) self-reported levels of OLC. The conversations were deliberately guided towards the subjects of innovation management processes (IP) and knowledge creation and dissemination within the business (OLC). The interviews with entrepreneurs/managers were conducted between May 4th and May 14th 2018. While the KIBS firms operate in professional (i.e.,

training) and technical (IT solutions related to global freight audit, payment and transportation management) sectors, the non-KIBS firms operate in manufacturing and consumer service sectors. Details on the analyzed subjects and their businesses are presented in Tables 3 and 4, respectively.

--- Insert Tables 3 and 4 about here ---

All four managers expressed similar views that innovation is important for business survival and performance; however, they also manifested that the matching between innovation and the business' day-to-day routines is much more complicated than originally expected. The main contrast observed between KIBS and non-KIBS managers is that the former group adopts a less systematic process for handling innovation processes than the latter.

For the group of KIBS firms, both managers indicated that the innovation processes are mostly non-systematic (non-procedural), while the manager of the innovative non-KIBS firms (non-KIBS-2) states that innovations in his business result from a formal, systematic process. From an organizational perspective, the difference in the way KIBS and non-KIBS firms harmonize innovation management processes and their day-to-day operations is in line with existing theoretical (e.g., Garicano and Wu, 2012) and empirical (e.g., Bustinza *et al.*, 2017; Lafuente *et al.*, 2018) studies that emphasize that in KIBS firms the high compatibility between knowledge creation and exploitation—which are at the heart of KIBS' objective function—and their operational features—i.e., development of knowledge-based services and high interaction with customers—facilitate the introduction of knowledge-based (and innovative) practices in their daily operations. Similarly, the more systematic innovativeness reported by one the non-KIBS firm (non-KIBS-2) may point to the difficulties for synchronizing innovation processes and business operations in businesses operating in non-knowledge intensive industries, such as customer service sectors.

Second, from the conversations with the selected managers emerged a manifest contrast between KIBS and non-KIBS firms in what concerns their organizational learning and decision making processes. In this case, the greatest distinction was found in the mechanisms used to channel knowledge among employees.

The two KIBS businesses claimed to use structured and participative knowledge dissemination processes. In the case of the professional-oriented KIBS (KIBS-1) formal on-the-job training, information technologies (online platforms), as well as participatory brainstorming sessions—i.e., the business encourages the participation of employees—are the selected mechanisms to create and disseminate knowledge among employees. The manager of the KIBS-2 firm indicated that training programs (on-the-job and IT-supported) are the primary channel used to

create and disseminate knowledge among employees. Note that in both KIBS firms the role of international partners is critical for knowledge creation and dissemination processes: KIBS-1 collaborates with the Brazil's Ministry of Education, while the KIBS-2 is part of a multinational business headquartered in Atlanta (US). Both KIBS firms encourage the use of codified knowledge—i.e. formal training—and organizational culture to implement innovation processes, practices that are in line with Garicano and Wu (2012) who stress that these aspects—i.e., codified knowledge and culture—may facilitate key organizational processes—in our case, innovation performance—via enhanced coordination and exploitation of the business' available talent.

A different picture emerges when analyzing the non-KIBS firms. On the one hand, the manager of the non-KIBS-1 firm indicated that knowledge creation is very limited in this business. On the other hand, knowledge creation and dissemination follows a very centralized process in the non-KIBS-2 firm. The conversations with the manager of the non-KIBS-2 firm revealed that the decision making about what knowledge to develop (or acquire) and what knowledge will be transmitted to employees is entirely controlled by management. Although the manager of the non-KIBS-2 firm claimed to have a fairly good grasp of all aspects of the business, this practice—which only evidences a decision-making hierarchy—restrains employees from accessing to potentially valuable knowledge and limits the business' capacity to exploit the employees' knowledge.

The observed differences in the way to manage the knowledge creation/dissemination process between KIBS and non-KIBS firms may offer signs to understanding the effect of learning capabilities on innovation performance reported in the quantitative model: OLC positively impacts IP (model 2 in Table 2) and the positive effect of OLC on IP is stronger in KIBS businesses than in non-KIBS firms (model 3 in Table 2). For example, Garicano and Wu (2012, p. 1382) show that horizontal communication is the most efficient tool to channel and exploit knowledge, while a knowledge hierarchy with specialized problem-solvers can increase communication costs. Regarding knowledge creation/dissemination, the observation of the qualitative analysis that highlights the collectivization of the decision-making process among KIBS and the use of a knowledge hierarchy by non-KIBS firms is in line with the tenor of the results of the quantitative model (section 4.1). A knowledge creation process controlled by a strong knowledge hierarchy is potentially detrimental to the access to potentially valuable knowledge, which may reduce the generally positive effect of organizational learning on innovation. On contrary, knowledge creation/dissemination tends to be much more successful if managers develop and promote a learning orientation from the very beginning of the knowledge transfer process. Thus, the result of the interaction term in model 3 of Table 2 (quantitative analysis) indicating that the effect of OLC on IP is stronger in KIBS firms is in line with the deductions emerging from the qualitative analysis.

5. Concluding remarks, implications and futures research lines

In this study, we proposed that organizational learning capabilities contribute to generate valuable knowledge that impacts innovation performance, and that this effect varies across businesses. More concretely, we hypothesized that the positive relationship between organizational learning capabilities and innovation performance is stronger in businesses—i.e., KIBS—where knowledge creation and exploitation constitute the main source of competitive advantage. The empirical application uses a sample of 74 Costa Rican high performance businesses for 2016.

Overall, this study provides further evidence that contributes to understand how businesses capitalize on their knowledge-based resources. Additionally, results reveal that the effects of organizational learning capabilities are heterogeneous across industry sectors. We argue that discrepancies may arise from operational differences that may condition the coupling of knowledge-generating efforts within the firm to core innovation actions.

This paper has implications for scholars and practitioners. From an academic perspective, though prior work shows that organizational learning capabilities yield to superior innovation performance (see, e.g., Alegre and Chiva, 2013; Kamasak *et al.*, 2016; Tohidi and Mandegari, 2012), this study demonstrates that the innovation-related repercussions of organizational learning capabilities are heterogeneous across industries. Our analysis of the role of the characteristics of business operations on innovation performance contributes to a better understanding of the conditions under which the effects of developing learning-enhancing strategies occur in businesses operating in different industries. Additionally, the proposed analysis of the relationship between organizational learning capabilities and innovation performance in KIBS and non-KIBS businesses contributes to increase the literature on business servitization (e.g., Bustinza *et al.*, 2018; Neely, 2008; Kohtamäki and Partanen, 2016; Vendrell-Herrero *et al.*, 2017).

For strategy makers, we first suggest that managers need to turn their attention to the characteristics of business operations when considering the development of organizational learning capabilities. Both knowledge generation and exploitation processes are critical for KIBS businesses (Lafuente *et al.*, 2010; Lafuente *et al.*, 2018; Skjølvsvik *et al.*, 2007). The specific operational features of KIBS firms—i.e., emphasis on knowledge-based inputs, development of value-adding customized services and frequent interaction with customers—encourage innovative initiatives that help generate new knowledge necessary to develop a sustainable competitive advantage. Organizational learning capabilities—i.e., the ability of a business to create or acquire, transfer and integrate knowledge (Chiva *et al.*, 2007)—play a decisive role in this process. Nevertheless, the prioritization of organizational learning capabilities is not enough for successful innovation. In this

sense, managers would be well advised to analyze the characteristics of business operations before developing learning capabilities. Thus, any attempt to promote organizational learning capabilities should be coupled with enhanced strategic analyses that acknowledge the value of this capability in potentially optimizing the outcomes of businesses' knowledge-based resources. This is especially evident in the case of businesses (KIBS) with strong incentives to engage in innovation processes.

Second, innovation can be understood as a means for organizational renewal (Slater *et al.*, 2014). Also, in line with Markides and Williamson (1994) and Lafuente *et al.* (2018), the results for the variable firm size suggest that innovation performance is not a strategic option available only to large firms with a greater capacity to deploy resources for this type of projects. Therefore, the design and implementation of innovation projects within the business—in the case of KIBS—as well as the development of collaborations with KIBS firms emerge as valid strategies that can prove themselves relevant in promoting innovation performance, regardless the size of the business.

It must, however, be mentioned a number of limitations to the present study that, in turn, represent avenues for future research. First, like other studies on organizational learning capabilities or innovation performance (e.g., Alegre and Chiva, 2013; Chiva *et al.*, 2007; Skjølsvik *et al.*, 2007), the proposed cross-sectional study does not permit the direct analysis of the underlying learning generating process that precedes innovation performance. Further research on this issue would be valuable. For example, future studies should evaluate the managers' and employees' response to business efforts for developing learning capabilities, and determine whether organizational learning capabilities are better implanted in businesses with more accurate information systems, and whether these systems mediate the relationship between organizational learning capabilities and innovation performance. Second, because the outcomes of organizational learning are not immediate and become evident over time, the connections between organizational learning capabilities and innovation performance need further analysis from a longitudinal perspective.

Third, organizational learning processes modify the business' current practices. From a strategic point of view, specifically designed future research can address this issue by evaluating the extent to which the relationship between organizational learning capabilities and innovation performance is conditioned by (low or high) changes in managerial practices and in organizational memory systems. Additionally, although our approach to product/service innovation is appropriate, future studies should analyze the impact of organizational learning capabilities on other types of innovations—e.g., non-technical or administrative innovation (Crossan and Apaydin, 2010; Damanpour and Evan, 1984) or strategic innovation (Teece, 2010)—in knowledge intensive and non-knowledge intensive industries.

Fourth, from a methodological perspective, the cross-sectional nature of the study data does not permit to tackle potential endogeneity problems arising from reverse causality or from the possible correlation between time-invariant unobserved heterogeneity and the explanatory variables. This aspect should be addressed in future studies using longitudinal data. Finally, the geographic specificity of the study calls for obvious caution when interpreting and generalizing its findings.

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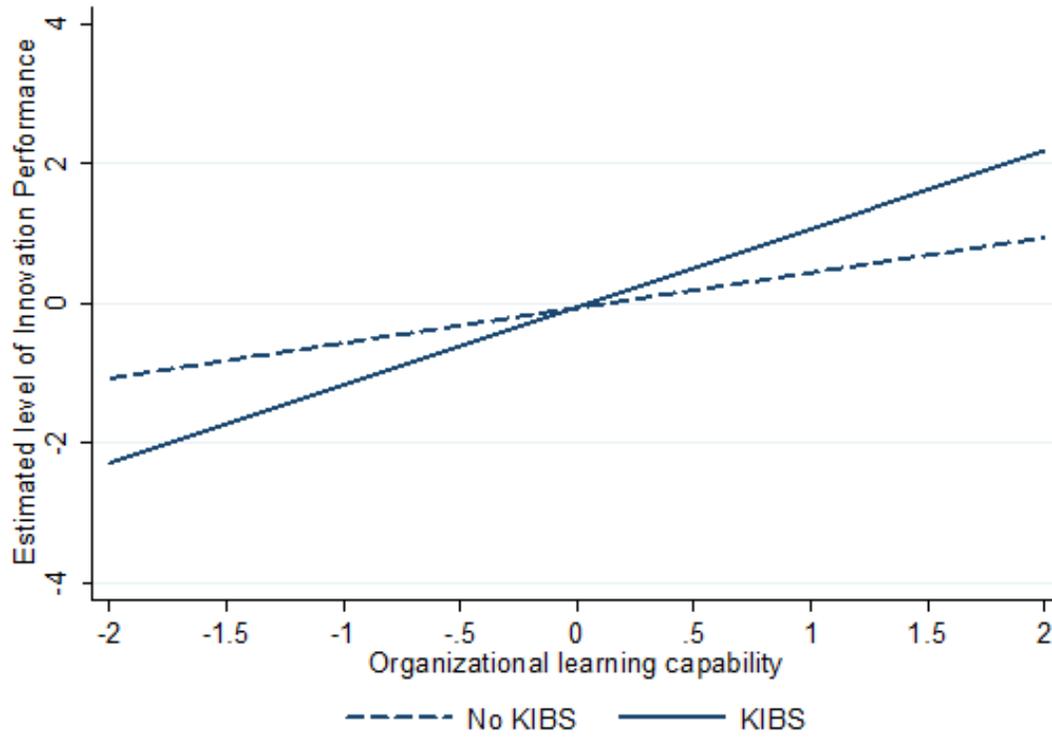
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Figure 1. The relation between OLC and innovation performance in KIBS and non-KIBS firms



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Table 1. Descriptive statistics and bivariate correlation matrix

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	IP	0.00	1.00	1										
2	OLC	0.00	1.00	0.53***	1									
3	KIBS	0.34	0.48	0.26**	0.29**	1								
4	Firm size (employees)	80.80	263.00	-0.05	-0.20	0.17	1							
5	Firm age (years)	16.36	16.27	-0.18	0.02	0.12	-0.12	1						
6	San José	0.49	0.50	0.19	0.19	0.05	-0.11	-0.10	1					
7	Alajuela	0.18	0.38	-0.28**	-0.24**	0.05	0.29*	0.20**	-0.45***	1				
8	Cartago	0.05	0.23	0.15	-0.07	-0.04	-0.05	-0.17	-0.23**	-0.11	1			
9	Guanacaste	0.08	0.27	0.03	0.00	-0.21*	-0.03	-0.05	-0.29**	-0.14	-0.07	1		
10	Heredia	0.08	0.27	-0.10	-0.13	0.21*	0.00	-0.04	-0.29**	-0.14	-0.07	-0.09	1	
11	Limon	0.04	0.20	-0.11	0.03	-0.01	-0.06	0.18	-0.20*	-0.09	-0.05	-0.06	-0.06	1
12	Puntarenas	0.08	0.27	0.06	0.15	-0.11	-0.06	0.00	-0.29**	-0.14	-0.07	-0.09	-0.09	-0.06

Sample size: 74 businesses. *, **, *** indicate significance at the 10%, 5% and 1%, respectively.

Table 2. Regression analysis: Organizational learning capability and innovation performance

	Model 1	Model 2	Model 3
OLC	0.7239 (0.1922)***	0.6970 (0.2068)***	0.5030 (0.2817)*
KIBS business		0.1298 (0.2402)	0.0132 (0.2424)
KIBS X OLC			0.6143 (0.3169)**
Business size (ln employees)	-0.0334 (0.0710)	-0.0309 (0.0716)	-0.0073 (0.0718)
Business age (ln years)	-0.3641 (0.1741)**	-0.3356 (0.1890)*	-0.3562 (0.1917)*
Province dummies	Yes	Yes	Yes
Intercept	1.1413 (0.5525)**	1.0058 (0.6175)*	0.9371 (0.6360)
F-test	3.83***	3.33***	12.24***
Adjusted R2	0.3180	0.3103	0.3388
RMSE	0.8259	0.8305	0.8131
VIF (minimum-maximum)	1.15 (1.09–1.25)	1.22 (1.13–1.42)	1.36 (1.19–2.95)
Jarque Bera test	0.9879 (chi2 value = 0.6102)	0.9719 (chi2 value = 0.6151)	0.9807 (chi2 value = 0.6124)
Observations	74	74	74

Robust standard errors adjusted by heteroskedasticity are presented in brackets. San Jose (capital) is the omitted province dummy. *, **, *** indicate significance at 10%, 5% and 1% level, respectively.

Table 3. Qualitative analysis: Characteristics of the managers

CHARACTERISTICS OF THE ENTREPRENEUR	KIBS-1	KIBS-2	NON-KIBS-1	NON-KIBS-2
Gender / Age	Woman / 50 years old	Woman / 39 years old	Woman / 38 years old	Man / 31 years old
Position	Manager	Manager	Operations Manager	Co-owner / Manager
Background	University studies (Business Administration and studies in Education)	University studies (Business Administration)	Secondary education	University studies (Business Administration and MBA)
Experience	She has 19 years of market experience as general manager and teacher. She is Brazilian and resides in Costa Rica since 1999. She currently works in two positions within the business: general manager and teacher.	She has 20 years of market experience in the business service sectors. She has previously worked for 2 businesses, both related to business services (logistics).	She has 20 years of experience in the jeans business. She previously worked for an international jeans manufacturer (global brand).	He has 16 years of market experience in the restaurant business. He has previous experience worked for various businesses in the same sector, including hotels and other restaurants. In 2012 he started working in the business as Food and Drinks Manager. In 2013 he became co-owner of the business, and he is currently working on the expansion of the business.

Table 4. Qualitative analysis: Characteristics of the analyzed businesses

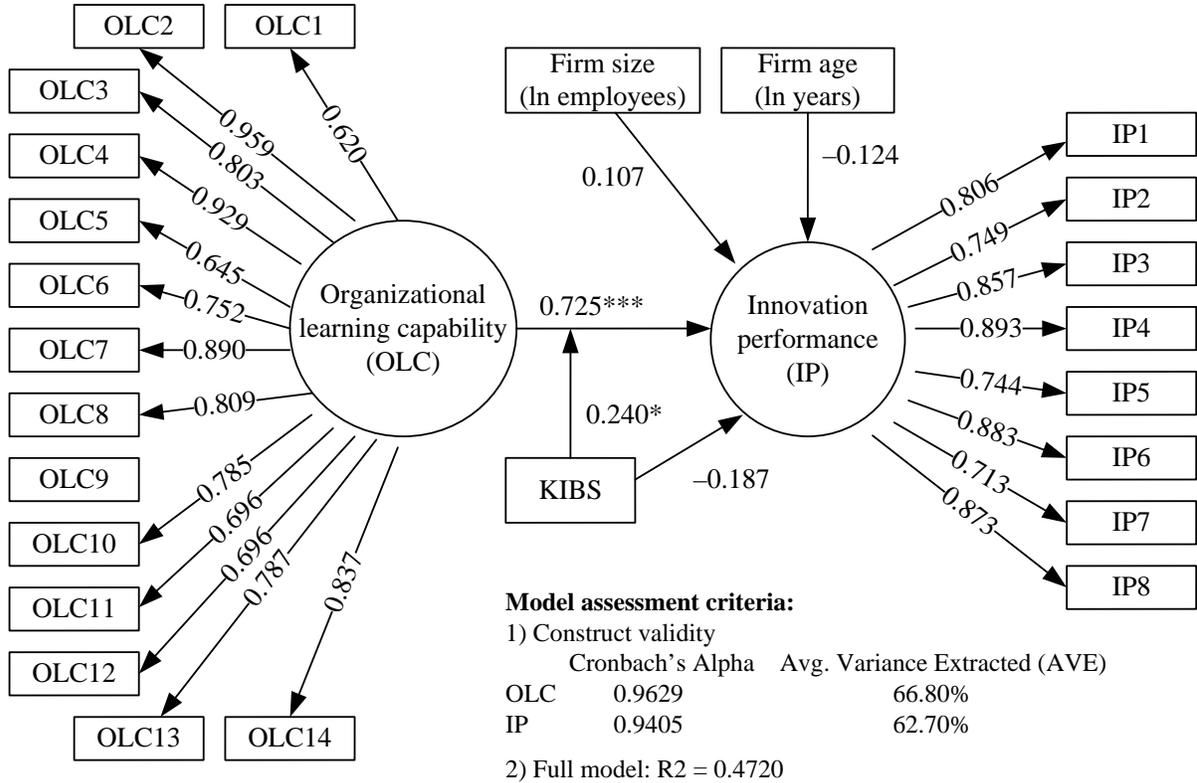
CHARACTERISTICS OF THE FIRM	KIBS-1	KIBS-2	NON-KIBS-1	NON-KIBS-2
Business age	45 years in the market	11 years in the market	18 years in the market	16 years in the market
Number of employees	50 employees in 2017	25 employees in 2017	15 employees in 2017	105 employees in 2017
Sector / activity	Education/training	Provision of IT tools and services	Manufacturing (jeans)	Consumer services (Restaurant)
Geographic location	San José	San José	Cartago	Puntarenas / San José
Product portfolio	The business offers in-company training programs and language courses (mostly Portuguese and English). The in-company services include training on, among others, team building, cooking and self defense.	The main activity is the provision of services related to Global Freight Audit, and Payment & Transportation Management Software Solutions. In the last 2 years they have introduced 5 new tools (enhanced service provision).	Manufacturer of jeans. Besides its 2 own brands, the business also produces jeans for other brands. They did not promote new products in the last 5 years, and only have introduced small variations (color or style) in the existing products.	The business specializes in the preparation of Japanese food. Each year, the management team promotes the renewal of the menu (compared to 2017, 30% of the actual menu is new).
Innovation management process	<p>I think that we are an innovative business. For example, we constantly try to develop new learning tools for teachers and participants. The promotion of innovations in this field (education) is a “permanent concern” to the business.</p> <p>The innovation process within the business is not procedural or systematic, but rather informal. We have introduced various innovations in the last few years, for example: a new platform to manage pedagogical and administrative processes; and the introduction of new, non-traditional courses (e.g., team-building, cooking, self defense). These new courses are often the result of suggestions by the teachers.</p>	<p>I think that the business is positioned as a mid-level innovative player in the market.</p> <p>The innovations in this type of business are related to service improvements. For example, we propose new tools, process and information for our clients. In the last 2 years we have introduced 5 new tools, 2 updated tools and various process improvements.</p> <p>I think that the innovation process in the business is not systematic. Most of the times innovation is a reaction to competitors’ moves.</p>	<p>I think that our business is not very innovative. Instead of introducing new products, in the last years only small changes in specific issues have been made (design, materials or colors).</p> <p>The innovation process is very informal. Usually first “see the market” before to propose or suggest changes to our clients.</p>	<p>Although we work in the food industry, our business is very innovative. For example, we change the menu twice a year and offer many seasonal products. Every year new products represent 30% of the product offering.</p> <p>As manager, I apply many controls (quality, suppliers, cost). Also, I start the innovation process (looking for new products) when I identify low-sales products.</p> <p>I consider that we have a formal (systematic) innovation process. Some important factors contributing to our innovation are the alignment with the strategic plan, engagement culture, use of marketing research, process documentation, use of ERP, and managerial controls.</p>

Table 4. Continued.

CHARACTERISTICS OF THE FIRM	KIBS-1	KIBS-2	NON-KIBS-1	NON-KIBS-2
<p>Knowledge dissemination within the business</p>	<p>Training is the primary method used within the business to transfer knowledge among workers.</p> <p>Employees have a pedagogical coordinator, whose mission is to divulge and share new knowledge.</p> <p>Because the business is part of an international network, employees have access to multiples training opportunities. Also, it is especially important to highlight that we have a collaboration agreement with the Brazil's Ministry of Education. This creates different training opportunities.</p> <p>The use of technology is the second approach used by the business for knowledge creation. Together with the employees (teachers) the pedagogical coordinator is permanently trying to look for new resources online (Internet) in order to improve the quality of teaching, in terms of contents and teaching methods. To disseminate this knowledge we use software and training sessions.</p>	<p>In this business different approaches are employed to create and disseminate knowledge. The first way to receive knowledge comes from the new ideas, processes and information that we receive from the headquarters (Atlanta, USA). Second, we capture new information from the national environment.</p> <p>For knowledge dissemination we use training programs (usually via Skype), and reports available online (Intranet).</p> <p>The organizational culture is a specific factor that I consider critical to explain the knowledge management within the business. For example, after every training program participants should take a mandatory final test in order to approve the training. Also, all employees can see in their electronic profile their trainings and records.</p>	<p>Knowledge creation processes are very limited in the factory.</p> <p>We have been using for a long time the same operational processes, technology and human resources.</p> <p>I think that we need to do more in this regard because currently we do not have any kind of knowledge creation or dissemination system. The only source of new knowledge results from the contact with suppliers who sometimes give us information about materials.</p>	<p>In the restaurant the knowledge creation basically results from the Chef's creativity and commitment. We have one executive sushi chef and 3 sushi cooks for each restaurant, which totals 10 sushi cooks.</p> <p>When the owner or a chef wants to create a new product, we make a new recipe. Other sources for new ideas are the clients, suppliers and information available online (Internet). When the new recipe is ready, we taste it with clients (focus group) and offer a temporary menu in order to test the quality and the level of acceptance of the new product. When the new recipe is approved, we make a data-sheet for dissemination, in order to share with the rest of cooks. In the restaurant we have an ERP to control all processes and costs.</p>

Appendix

Table A1. Partial Least Squares Structural Equation Model (PLS-SEM): Organizational learning capability and innovation performance



Note: The construct innovation performance includes eight variables coded on a 7-point Likert scale (1= very poor and 7= excellent): IP1) replacement of products being phased out, IP2) extension of product range within main product field through technologically new products, IP3) extension of product range within main product field through technologically improved products, IP4) extension of product range outside main product field, IP5) development of environment-friendly products, IP6) market share evolution, IP7) opening of new markets abroad, and IP8) opening of new domestic target groups. The construct organizational learning capability is measured via 14 items coded on a 7-point Likert scale (1= strongly disagree and 7= strongly agree): OLC1) people here receive support and encouragement when presenting new ideas, OLC2) initiative often receives a favorable response here, so people feel encouraged to generate new ideas, OLC3) people are encouraged to take risks in this business, OLC4) people here often venture into unknown territory, OLC5) it is part of the work of all staff to collect, bring back, and report information about what is going on outside the company, OLC6) there are systems and procedures for receiving, collaborating and sharing information from outside the company, OLC7) people are encouraged to interact with the environment: competitors, customers, technological institutes, universities, suppliers etc., OLC8) employees are encouraged to communicate, OLC9) there is a free and open communication within my work group, OLC10) managers facilitate communication, OLC11) cross-functional teamwork is a common practice here, OLC12) managers in this business frequently involve employees in important decisions, OLC13) policies are significantly influenced by the view of employees, and OLC14) people feel involved in main company decisions. The software SmartPLS 3.0 was used to compute the PLS-SEM coefficients. *, **, *** indicate significance at 10%, 5% and 1% level, respectively.