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Open collaborative innovation process and their relationship with university-
industry and innovation performance

Processo colaborativo de Open Innovation na relação Universidade-Indústria e a
performance de inovação

São Paulo

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*A minha mãe, minha eterna
inspiração e a meus avós
amados que me deixaram o
legado da fé.*

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À minha mãe (*in memoriam*) e avô (*in memoriam*) toda a minha gratidão pelo exemplo deixado, pela educação que recebi e por me ensinarem a amar os livros.

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“A **criatividade** é a inteligência se divertindo”.
(Albert Einstein)

ABSTRACT

Saraceni, S. (2018). *Open collaborative innovation process and their relationship with university-industry and innovation performance* (PhD Thesis). University of São Paulo School of Economics, Administration and Accounting Department of Administration, São Paulo.

This study explores whether, in the open innovation practices, the knowledge that flows across organizational boundaries, during the collaborative University-Industry process, can positively affect Innovation Performance, Organizational Performance and Organizational Innovation in the analysis across companies/industries in Brazil.

This research employed an empirical study by use of the questionnaire survey method. The survey was conducted with employees from all sectors of the industry listed across 783 largest companies in Brazil. Using structural equation modeling (SEM) a proposed model was tested and validated based on the statistical analysis of the data collected from 504 employees from innovation departments.

The main theoretical and impact contributions of the study to society are: a) to understand how companies in Brazil are organized to absorb and transfer the knowledge generated by collaborative projects between universities and companies; b) generate subsidies for public and private policies in the efficient use of collaboration between University-Industry, from the identification in the innovation activities of the manufacturing industry in Brazil.

The theoretical contribution of this research is the creation of an integrative theoretical framework of theories and collaborative innovation processes, operationalized through the structural equation modeling for data analysis of twelve constructs (Knowledge Transfer; Intrinsic Motivation; Acquired Knowledge; Innovative Culture; Absorptive Capacity; Organizational Learning; Transformational Leadership; Knowledge Management; Organizational Innovation; Innovation Performance; Organizational Performance; Competitor Performance), based on dependency relationships, derived from open innovation theory, with the goal that companies and universities in Brazil improve their collaborative process. The management contribution of this research is that this framework can provide useful tools to deepen the understanding of Knowledge Transfers in the collaborative process between university and company, so that public bodies could create public policies in Brazil and that result in a closer relationship between them.

Keywords: Innovation. Open Innovation. Collaborative Innovation. Knowledge Transfer. Organizational Performance. Innovation Performance. Competitor Performance.

RESUMO

Saraceni, S. (2018). *Processo colaborativo de Open Innovation na relação Universidade-Indústria e a performance de inovação* (Tese de Doutorado). Faculdade de Economia, Administração e Contabilidade, Universidade de São Paulo, São Paulo.

Este estudo explora se o conhecimento que flui através das fronteiras organizacionais durante as práticas de Open Innovation, no processo colaborativo Universidade-Indústria, pode afetar positivamente o Desempenho da Inovação, o Desempenho Organizacional e a Inovação Organizacional na análise entre empresas/indústrias no Brasil.

Para este estudo realizou-se uma pesquisa empírica do tipo survey. A pesquisa foi realizada com funcionários de todos os setores da indústria listadas entre as 783 maiores empresas do Brasil. Usando a modelagem de equações estruturais (SEM), um modelo proposto foi testado e validado com base na análise estatística dos dados coletados de 504 funcionários dos departamentos de inovação.

As principais contribuições teóricas e de impacto do estudo para a sociedade são: a) entender como as empresas no Brasil estão organizadas para absorver e transferir o conhecimento gerado por meio de projetos colaborativos entre universidades e empresas; b) gerar subsídios para políticas públicas e privadas no uso eficiente da colaboração entre Universidade e Indústria, a partir da identificação nas atividades de inovação da indústria de transformação no Brasil.

A contribuição teórica desta pesquisa é a criação de um arcabouço teórico integrativo de teorias e processos de inovação colaborativa, operacionalizado por meio da modelagem de equações estruturais para análise de dados de doze construtos (Transferência de Conhecimento; Motivação Intrínseca; Conhecimento Adquirido; Cultura Inovadora; Capacidade Absortiva; Aprendizado Organizacional; Liderança Transformacional; Gestão do Conhecimento; Inovação Organizacional; Performance Organizacional; Performance de Inovação, Performance de Concorrentes), baseado em relacionamentos de dependência, derivados da teoria de Open Innovation, com o objetivo de que empresas e universidades no Brasil melhorem seu processo colaborativo. A contribuição gerencial desta pesquisa é que essa estrutura possa fornecer ferramentas úteis para aprofundar o entendimento das Transferências de Conhecimento no processo colaborativo entre universidade e empresa, para que órgãos públicos possam criar políticas públicas no Brasil e que resultem em uma relação mais próxima entre eles.

Palavras-chave: Inovação; Open Innovation; Inovação Colaborativa; Transferência de Conhecimento; Performance Organizacional; Performance de Inovação, Performance de Concorrentes.

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1. INTRODUCTION

We live in a globally integrated economy, with a society that easily acquires knowledge and information, creating a demand that makes companies increasingly innovative and complex products and services. Bell (1976), the sociologist, said that as the economy of a society experiment a transition of goods to the provision of services, knowledge becomes a valued form of capital. Consequently, the production of new ideas becomes the primary way to grow the economy. Many scholars say that today's most advanced economies are fundamentally knowledge-based (Dunning, 2000; Baum, O'Connor, & Yigitcanlar, 2008; Carrillo, Yigitcanlar, García, & Lönnqvist, 2014).

Innovation has been seen as the main driver to establish a competitive edge and generate economic growth (Cooke & Leydesdorff, 2006; Pancholi, Yigitcanlar, & Guaralda, 2014). The innovation process, perhaps more than any other economic activity, depends on knowledge (Feldman, 1994).

According to West, Salter, Vanhaverbeke and Chesbrough (2014), since 1970, innovation scholars have understood the sources of innovative ideas often come from outside the firm. Knowledge has been the gateway to innovation. In the era of knowledge economy nowadays, innovation becomes a key source of competitive advantages (Daghfous, 2004; Prajogo & Ahmed, 2006). That is, "having a competitive innovation edge is the key to firm survival in the global rivalry" (Yigitcanlar, 2016, p.314).

Recently, Open Innovation (OI) has received a special attention in the academic world and industry practice. Uzienė (2015) states that the central idea behind Open Innovation is the fact that a company cannot rely entirely on its own research, but must incorporate external knowledge, processes, inventions, and collaborators into joint research and development processes, leveraging these connections, as we must consider that we live in a world of widely distributed knowledge and intellectual resources.

Complementary to a firm's own innovation activities, academic research, implemented by universities and public research organizations, has been showing a significantly contributing in the ability to create innovations (Tether & Tajar, 2008; Baba, Shichijo, & Sedita, 2009). Technological collaboration constitutes a primordial instrument in this knowledge-sourcing process and companies therefore engage in collaboration with different partner types such as customers, suppliers, competitors and universities (Belderbos, Carree, Diederer, Lokshin, & Veugelers, 2004a; Belderbos, Carree, & Lokshin, 2004b; Enkel, Gassmann, & Chesbrough, 2009; Fritsch & Lukas, 2001).

The external search for knowledge and its integration between universities and companies in the context of open innovation it is an experience that can drive to increased success in a company. The desire for more Knowledge Transfer among Universities and Industry has increased, but unfortunately, not yet been sufficiently explored remain many attempts at this kind of Knowledge Transfer are unsuccessful mainly in developing countries such as Brazil. We can thus consider that the knowledge flow from University to Industry will increase in quality and quantity if certain facilitators are in place to stimulate the process of Knowledge Transfer.

The motivation to understand the collaborative projects in greater detail came from the perception that there were differences between how to carry out collaborative projects in developed countries and Brazil. It may be noted in the literature that many academic researchers have not studied many of the complexities associated with the transfer of knowledge from universities to industry and therefore no accurate information was get to improve this process in developing countries.

Despite its significance, recent studies have not addressed an important question: what is the gain that companies may have in terms of Organizational and Innovation Performance when they absorb the use of the external knowledge coming from University-Industry collaboration?

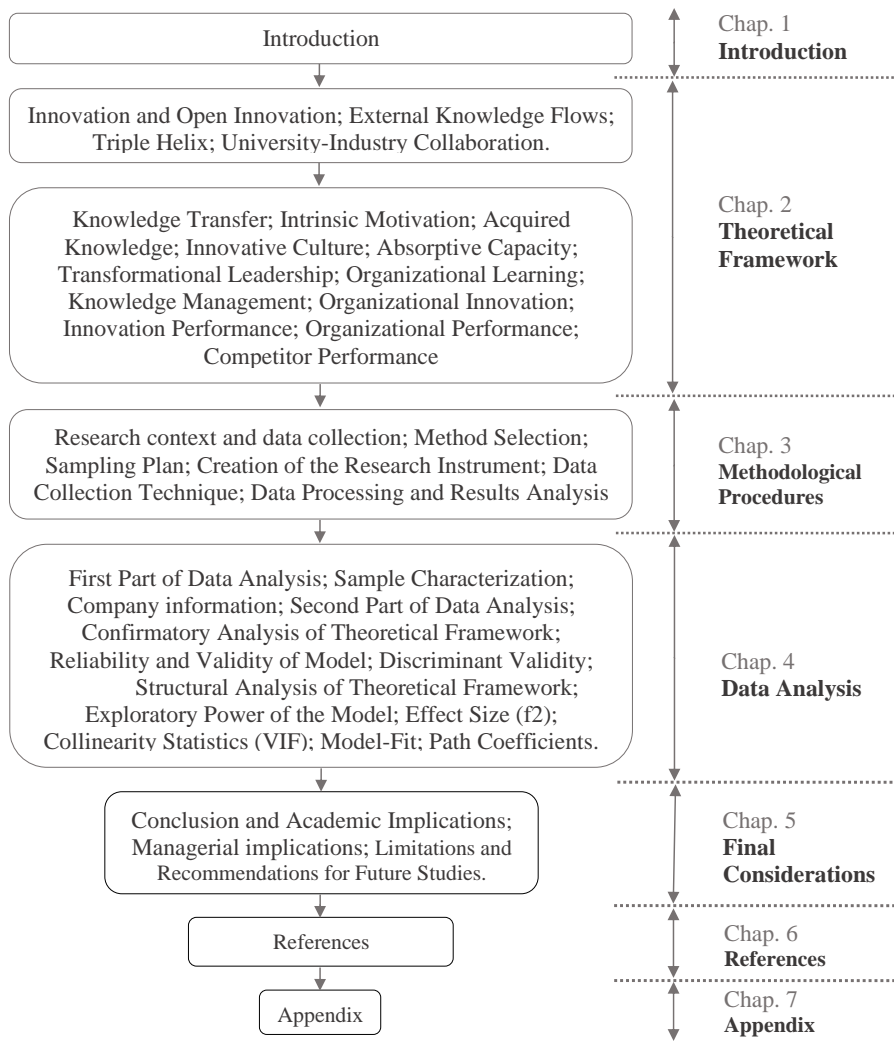
Thus, this project analyzes the collaborative relationship between University-Industry and its process in the transfer, absorption, motivation, acquisition and management of knowledge and its consequence in the organizational innovation, learning innovation, transformational leadership, innovation performance and organizational performance in Brazilian companies.

The aim of the research is to understand if knowledge acquired outside an organization through an open innovation practices in the University-Industry collaborative process can positively affect Innovation Performance, Organizational Performance and Organizational Innovation.

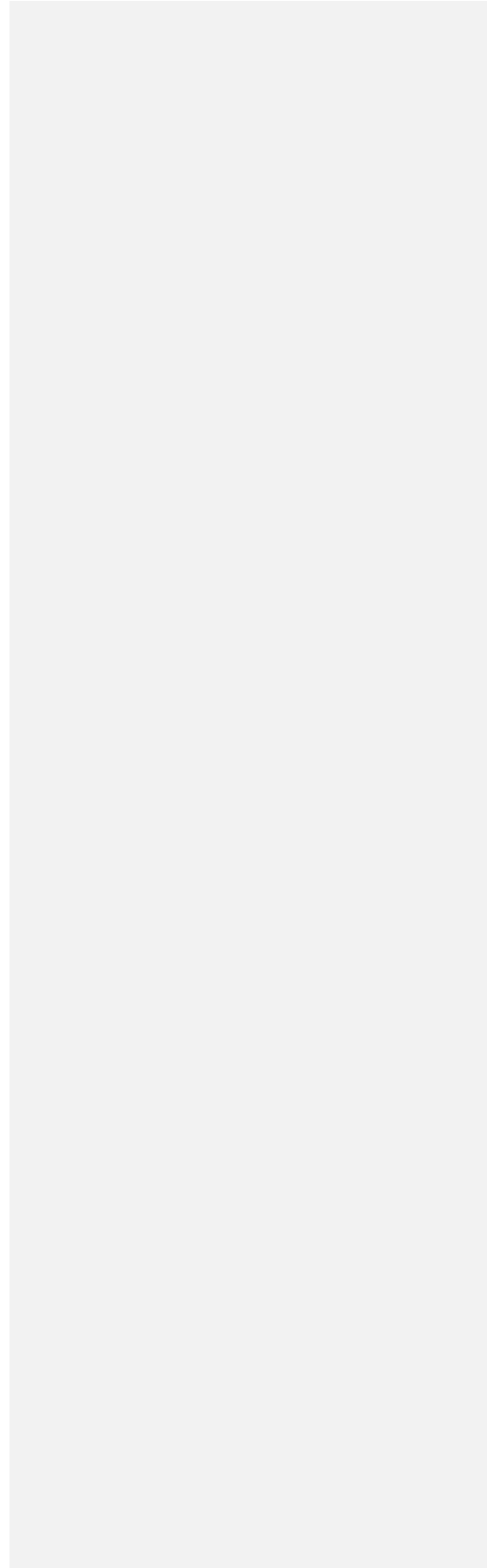
The structure of this study was as follows. A literature review was discussed in chapter 2, and twenty-four hypotheses were also proposed in this section. In Section 3, this study described the methodology, sample and data collection and measures of the constructs. Then, the descriptive statistics, the reliability of the measure, the correlations between the constructs and the results were shown in Section 4. In the end, this study mentioned the conclusions, implications, limitations and recommendations in Section 5.

Figure 1 shows the organization of the study in a schematic way:

Figure 1 - Logical Sequence of the Study



Source: based on Szafir-Goldstein, 2000.



2. THEORETICAL FRAMEWORK

In the theoretical foundation, we will see the context in which innovation was inserted in modern companies and the consequent "openness" to acquire external knowledge coming from the University for Industry. From there, we will talk about each construct used in the construction of the theoretical framework.

2.1 INNOVATION AND OPEN INNOVATION

Lee, Olson and Trimi (2012) argue that the modern world has gone through three major transformations that have definitely affected people's lives and work: the agricultural revolution, the industrial revolution, and the information revolution. For them, today the world is at the beginning of the fourth wave: the innovation revolution.

The authors state that innovation is a broad concept that can mean scientific inventions, patents, technological advancements, or even a simple new way of doing things. According to Lee et al. (2012), innovation is the key for organizations to develop competitiveness and success in this market that has undergone many changes.

Gupta and Govindarajan (2003) argue that the main purpose of innovation is to create value for an organization and its stakeholders. And not only that, according to Lee et al. (2012), innovation is the solution for organizations to develop competitiveness and success in this market that has undergone many changes. In the Oslo Manual (OECD, 2005), innovation is defined as the implementation of a new or improved product or process and a new marketing or organizational methods in intercompany operations, workplace organization and business relations.

As stated by some scholars, Schumpeter (1934) was the first to investigate innovation explicitly. Schumpeter's work is often cited in articles on innovation, due to his proposed classification of innovation as radical and incremental innovation, which is responsible for maintaining the capitalist system.

In the 1950s, Drucker (1954) stated that for the sole purpose of creating value for customers, any company has two – and only these two – basic functions: marketing and innovation. A few decades later, Doyle (1988) reaffirmed Drucker's stance by saying that "in most companies innovation is considered the key to business success. In today's rapidly changing environment a firm cannot maintain its market share or profitability unless it is innovative" (Doyle, 1988, p. 1).

The capacity to innovate is fundamental to sustain competitive advantage (Chen & Huang, 2010; Subramaniam & Youndt, 2005). Innovation has become a key activity that can not only influence the viability of a business but also triggers a social and economic change (Cheng, Chang, & Li, 2013; Kim & Harnang, 2011). Innovation is vital to the survival of modern corporations (Ko, To, Zhang, Ngai, & Chan, 2011).

Dereli (2015) indicates the existence of four different types of innovation: product innovation, process innovation, marketing innovation and Organizational Innovation, which in turn can be grouped into technological and non-technological innovation.

Earlier in this century, Chesbrough (2003) coined the term 'Open Innovation' (OI) for innovative collaborative efforts to create value "inside out" and "outside in." Lee et al. (2012) argue that "Information and Communication Technologies" (ICTs) have been the catalyst for the digital world, where anyone with access to the Internet can collaborate, cooperate and co-create for the generation of value.

By opening to the external environment, a company has access to relevant knowledge for its innovation process, particularly consumer knowledge, as evidenced in the work on value co-creation (Enkel et al., 2009). Thus, collaborative relationships enable access to a large amount of knowledge for innovation processes (Huizingh, 2011), allowing a company to be open to new ideas from the external environment (Reed, Storrud-Barnes, & Jessup, 2012) and to move forward to joint R&D development models and new value co-creation practices (Huston & Sakkab, 2006). Promoting the learning of a relationship with external partners positively affects the development and innovation of new products (Rothaermel & Deeds, 2004).

Laursen and Salter (2006) say that the main part of the innovation process involves looking for new ideas that have commercial potential and the search for external knowledge is an important managerial task. The idea that external knowledge is an essential element to optimize in-house innovation has been revitalized since Chesbrough published his book on open innovation, (Chesbrough, 2003). The use that firms make of external knowledge in the production process is called inbound open innovation (Chesbrough & Crowther, 2006).

Chesbrough and Bogers (2014, p. 1) defined open innovation "as a distributed innovation process based on purposely managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model".

As Chesbrough (2004, p. 23) formulated, "open innovation paradigm assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to

market, as the firms look to advance their technology". The concept of "Open Innovation" was introduced following the need of companies to open their innovation process beyond its traditional boundaries.

In the field of open innovation, we can categorize theoretical developments in the field of schools of thought (Gassmann, 2006) and of authors or processes (Chesbrough, Vanhaverbeke, & West, 2006; Gassmann & Enkel, 2004; Prahalad & Ramaswamy, 2004). Open Innovation is also referred to in the literature as 'Openness' (Laursen & Salter, 2006; Huizingh, 2011), consisting of continuous approaches that range from closed to fully open (Dahlander & Gann, 2010; Huizingh, 2011; Bader & Enkel, 2014). It is generally measured by the degree of openness through the breadth of collaboration (i.e., the number of sources of external knowledge in the innovation process) and by the depth (the intensity of collaboration as collaborative interactions deepen, from shallow to deep collaboration) (Laursen & Salter, 2006; Lazzarotti, Manzini, & Pellegrini, 2011).

Gassmann and Enkel (2004) identified three main "Open Innovation" processes: (1) Outside-in: enriching a company's own knowledge base through the integration of suppliers, customers and external knowledge sourcing that can increase a company's innovativeness. (2) Inside-out: The external exploitation of ideas in different markets, selling IP and multiplying technology by channeling ideas to the external environment. (3) Coupled: A link between outside-in and inside-out by working in alliances with complementary businesses during which give and take is crucial for success.

For many researchers, we are in the age of open innovation and as a result, collaborative work has created increased advantages, resulting in a vital innovation process, which is directly linked to value creation. Lee, Olson and Trimi (2010) say that open innovation and collaborative innovation are evolutionary stages that innovation has undergone in the last three decades.

The concept of open innovation (OI) emphasizes the notion of leveraging external knowledge and has become increasingly popular both in academic research and industry practice (Chesbrough & Bogers, 2014). Perkmann and Walsh (2007) declare that the concepts of open, networked and interactive innovation, however, would suggest that actual relationships between universities and industry – rather than generic links – play a stronger role in generating innovations. Those Knowledge Transfer relations, in an Open Collaborative Innovation environment, between industry and university, will be seen later. In the next section, we'll understand a little more about this external knowledge acquired by opening companies to innovation.

2.2 EXTERNAL KNOWLEDGE FLOWS

In 1997, Teece, Pisano and Shuen (1997) said that in a dynamic and turbulent environment, knowledge represents a critical resource to create value, to develop and sustain competitive advantages. Whereas this complex and competitive system that we live in, knowledge is an imperative key factor, firms increasingly depend upon external sources of information to promote innovation and improve their performance (Cassiman & Veugelers, 2002; Morgan & Berthon, 2008).

According to theories based on company knowledge, the central problem in modern economies is the coordination of specialized and distributed knowledge (Demsetz, 1988; Kogut & Zander, 1992; Nickerson & Zenger, 2004). There is a movement toward the knowledge economy that not only represents a new competitiveness challenge but also a change in both the nature of organizations and the way in which they devise and implement their strategies (Huggins, 2011; Esmailpoorarabi, Yigitcanlar, & Guaralda, 2016).

Polanyi (2009) shaped fundamentally the Knowledge Transfer literature. He says that if knowledge can be transferred from one individual to another using some type of formal communication system, it can be classified as explicit. Therefore, explicit knowledge must be articulable or codifiable. The tacit knowledge (skills, know-how, and contextual knowledge) is generally viewed as knowledge that cannot be formally communicated. Tacit knowledge is without a doubt more valuable, explicit knowledge is easy to obtain and can be exploited quickly (Polanyi, 2009). After that, the recognition of those two different types of organizational knowledge, the tacit and explicit knowledge became the critical contribution of the knowledge-based view (Grant, 1996a; Nonaka, 1994; Spender, 1996).

There are also certain types of knowledge that some research focuses on such as the transfer of skills and technology (Tsai, 2002), the exchange of business practices (Szulanski, 1996), or the acquisition of tacit knowledge (Kogut & Zander, 1993; Subramaniam & Venkatraman, 2001).

Over the last two decades, the recognition of the importance of external knowledge flows is an important phenomenon seen in the organization of the innovation process within corporations (Rigby & Zook, 2002). The idea that the generation of new knowledge is primarily an internal process is gradually being abandoned by companies (Arora, Fosfuri, & Gambardella, 2001; Gans & Stern, 2003).

Complementary knowledge refers to new external knowledge that is related to and at the same time different from the firm's existing knowledge bases (Lofstrom, 2000). External

knowledge enables the firm's internal knowledge to be extended by stimulating competitiveness and innovation (Matusik & Heeley, 2005). The acquisition of new knowledge is the main innovation resource (Nonaka & Takeuchi, 1995b; Teece et al., 1997).

Von Hippel (1988) highlights that a different source to accumulate external knowledge could be used to a firm, including, for instance, suppliers, clients, competitors, universities, other research institutions, specialized journals, conferences and meetings. A great number of authors have emphasized the crucial role of combining internal and external knowledge in innovation processes (Andersen & Drejer, 2008; Hargadon & Sutton, 1997; Von Hippel, 1988).

The exposure to external knowledge within their environment contributes with the firms to the quality of decision-making (March & Simon, 1993), facilitates the development of future capabilities (McGrath, MacMillan, & Venkataraman, 1995), extends the array of available resources (Brown & Eisenhardt, 1995) and, ultimately, foment the level of experiential learning gathered to manage and generate value from outside information (Norman, 2004; Fosfuri & Tribó, 2008).

Firms need to identify, process, and exploit these external knowledge inflows, in order to produce tangible benefits (Cohen & Levinthal, 1989; Gottfredson, Puryear, & Phillips, 2005). There is a greater propensity to capitalize on changing environmental conditions, companies that consistently invest in the assimilation and exploitation of new external knowledge, generating innovative products and meeting the needs of emerging markets (Chen & Huang, 2009; Jansen, Van Den Bosch, & Volberda, 2006; Lichtenthaler, 2009).

Chen, Lin, and Chang (2009) mention some forms of knowledge important for Organizational Innovation: acquisition, assimilation, transformation and exploitation. Acquisition of knowledge is the ability to recognize, value, and acquire external knowledge that is critical to a firm's operations (Lane & Lubatkin, 1998; Zahra & George, 2002). Assimilation of knowledge means a firm's routines and processes that allow it to understand, analyze, and interpret knowledge from outside sources (Chen et al., 2009). Transformation of knowledge means the firm's ability to develop routines that facilitate combining existing knowledge with newly acquired and assimilated knowledge (Zahra & George, 2002). Exploitation of knowledge is a firm's ability to apply new external knowledge commercially to achieve organizational objectives (Lane & Lubatkin, 1998).

To arrive at an integrative view of managing knowledge in open innovation, Lichtenthaler and Lichtenthaler (2009) distinguish internal and external knowledge exploration, retention, and exploitation. External knowledge exploration describes the acquisition of knowledge from external sources (Lane, Koka, & Pathak, 2006). Internal knowledge

exploration refers to generating new knowledge inside the firm, e.g. inventions resulting from research (Smith, Collins, & Clark, 2005). External knowledge retention refers to knowledge maintained in a firm's interorganizational relationship, like alliances (Gulati, 1999). Internal knowledge retention is a result of the need for maintaining knowledge over time (Garud & Nayyar, 1994). External knowledge exploitation refers to outward Knowledge Transfer, e.g. by means of technology alliances or technology licensing (Lichtenthaler, 2007). Internal knowledge exploitation describes internal innovation, i.e. knowledge application in a firm's own products (Brown & Eisenhardt, 1995).

To capture internal and external knowledge exploration, retention, and exploitation, Lichtenthaler and Lichtenthaler (2009) propose six knowledge capacities (Argote, McEvily, & Reagans, 2003; Lane et al., 2006): inventive, absorptive, transformative, connective, innovative, and desorptive capacity (Table 1).

Table 1 - The Knowledge Capacities

	Knowledge exploration	Knowledge retention	Knowledge exploitation
Internal (Intrafirm)	Inventive capacity	Transformative capacity	Innovative capacity
External (Interfirm)	Absorptive capacity	Connective capacity	Desorptive capacity

Source: Lichtenthaler and Lichtenthaler (2009)

The agreement with Lichtenthaler and Lichtenthaler (2009) inventive capacity refers to a firm's ability to internally explore knowledge, i.e. to generate new knowledge inside the firm.

For contributing to the economic development of a nation, in the knowledge economy era, the universities are vital in the innovation system (Etzkowitz, Webster, Gebhardt, & Terra, 2000; Florida & Choen, 1999; Phillips & Eto, 1998; Larédo & Mustar, 2001). The university roles in knowledge and technology innovation tend to become more diverse (Godin & Gingras, 2000), through activities such as developing skilled human capital, transferring knowledge and technology to industry, and becoming the seedbed of new enterprises (Lazzeroni & Piccaluga, 2003). The exchange of knowledge between academia and industry has been considered an important factor for innovation and economic growth, as it facilitates the development of new

scientific knowledge in companies (Bercovitz & Feldmann, 2006; Mowery, Nelson, Sampat, & Ziedonis, 2015).

The university, the government and the industry can be considered to be a social community creating, sharing and transferring explicit and tacit knowledge. In the next section, we provide the theoretical background of Triple Helix, this relationship between university, government and industry.

2.3 TRIPLE HELIX

The Universities incorporated research among their functions in the 19th century and after that they received strong support from industry (Etzkowitz & Leydesdorff, 2000). The calls for a more active role of the university in society, among other reasons, are behind the economic crisis of the 1970s and a better understanding of the complex link between industrial innovations and scientific activities (Kline & Rosenberg, 1986).

One of the Triple Helix (TH) thesis states that the university can play an enhanced role in innovation in increasingly knowledge-based societies (Etzkowitz & Leydesdorff, 2000). This transition has led to a reevaluation of the mission and role of the university in society, it happened in the USA (in 1970s), in various Western European countries (in 1980s), Latin America and Asia.

In the 1990s, the use of the Triple Helix model that focuses on the knowledge infrastructure of the innovations provided by university-industry-government relations was recommended for economic development and the importance of Triple Helix collaboration was widely recognized.

Etzkowitz and Leydesdorff (2000) say that different possible resolutions of the relations among the institutional spheres of university, industry, and government can help to generate alternative strategies for economic growth and social transformation. They say that “the common objective is to realize an innovative environment consisting of university spin-off firms, tri-lateral initiatives for knowledge-based economic development, and strategic alliances among firms large and small, operating in different areas, and with different levels of technology, government laboratories, and academic research groups” (Etzkowitz & Leydesdorff, 2000, p. 112).

The Triple Helix model constitutes a spiral model of innovation which analyses reciprocal relations in different moments in the knowledge capitalization process (Etzkowitz, 2003) through three dimensions: (1) internal transformation of each of the “helices”

(University–Industry–Government), (2) mutual influence among the three “helices” and (3) creation of a new superimposition of trilateral networks and organizations resulting from interaction between the three “helices”.

Prior studies have indicated that collaboration among those three institutional spheres can be a critical factor for success in improving regional and national innovation systems (Etzkowitz et al., 2000; Motohashi, 2005).

In this study, even though we know that the government is related in this environment, our attention will be focused in the collaboration between University and Industry, what is called UIC (University-Industry Collaboration).

2.3.1 University-Industry Collaboration

Bozeman and Boardman (2014) use the term collaboration to describe the relationship between organizations, individuals or between organizations and individuals. However, it is important to note that collaborations, even organizational ones, do occur between individuals. First, it is important to understand the difference of two distinct concepts found in the literature, the concept of cooperation and the concept of collaboration.

Collaboration focuses on the essence of learning, on the common and shared vision of goals, involves a greater commitment (Adobor, 2006), requires greater trust among the actors and presupposes generation of results that are co-credited between the parties (Jiang, Li, Gao, Bao, & Jiang, 2013).

In projects where the goal is to develop a new technology, joining different actors with different competencies can be a relevant way to reduce the costs and efforts to develop new ideas, technologies, solutions and the creation of meanings that are not part of the company's routine (Matusik & Hill, 1998). Collaboration between actors can be a relevant strategy to achieve desired development with lower cost and higher speed.

The literature considers the crucial importance of the knowledge firms obtain through their relationships with scientific partners such as universities and knowledge institutes, namely organizations that perform a key role within contemporary societies by educating large proportions of the population and generating knowledge (Perkmann et al., 2013).

The new aim of universities that the scholars have claimed is to become entrepreneurial universities that contribute to national economic development and that attain a financial advantage through the commercial and industrial application of research (Etzkowitz et al., 2000; Martin, 2003). In the traditional model, the missions of a university are teaching, research, and

service to industry. Currently, universities are implementing various mechanisms for encouraging faculties and students to engage in entrepreneurial activities (Tornatzky, Waugaman, & Gray, 2002).

Firms can acquire important input for industrial innovation when they collaborating with universities (Gulbrandsen & Slipersaeter, 2007; Du, Leten, & Vanhaverbeke, 2014).

Greater collaboration between academia and industry is an activity encouraged by governing authorities. According to scholars, as Barnes, Pashby and Gibbons (2002), it is a growing trend around the world as a means of increasing national competitiveness and rapid technological change, thus improving the efficiency of innovation and the creation of wealth.

Barnes et al. (2002) say that:

Collaboration provides companies with the means to which advance technologically, at lower cost and with less inherent risk. Collaboration also provides access to a greater breadth and depth of knowledge and technologies than would normally be possible through internal development. For universities the benefits include additional public and private funding, and increasingly, licensing and patenting income, as a result of technology transfer activities. (Barnes et al., 2002, p. 272)

Dodgson (1991) says that the major reason is that collaborations between, often diverse, organizations, need considerable management effort in order to be successful (Dodgson, 1991). It is sound that it is important to ensure that collaborations are managed effectively, and the benefit achieved maximized, given the substantial investment (both public and private) currently being made in collaborative research activities.

Universities—industry collaboration (UIC) refers to the interaction between any parts of the higher educational system and industry aiming mainly to encourage knowledge and technology exchange (Bekkers & Freitas, 2008; Siegel, Waldman, & Link, 2003). UIC have had a long history (Bower, 1993; Oliver, 2004), as one means of construct organizations' knowledge stock (Cricelli & Grimaldi, 2010). Of late, there has been a substantial increase in these collaborations in several nations this increase has been attributed to a combination of pressures on both industry and universities (Giuliani & Arza, 2009; Meyer-Krahmer & Schmoch, 1998).

The industry has undergone some pressures, including rapid technological changes, shorter life cycles and intense global competition that have radically transformed the current competitive environment for most companies (Bettis & Hitt, 1995; Wright, Clarysse, Lockett, & Knockaert, 2008). According to Hagen (2002), the pressures included the growth of new knowledge and the challenge of increasing costs and financing problems, which have placed enormous weight on universities to seek relationships with industry.

In addition, there is growing social pressure on universities to be less valued in order to satisfy the broader social skills (education and knowledge generation) they have had in the past and more as engines for economic growth (Blumenthal, 2003; Philbin, 2008).

These pressures on both sides have led to a growing stimulus for the development of UICs that, through the exchange of knowledge between the academic and commercial domains, aim to increase innovation and economic competitiveness at institutional levels (Perkmann et al., 2013).

In this study, when we mention about Universities, we are referring not only to University-Industry Collaboration (UIC), but also to other knowledge transfer centers / facilitators who are involved with Universities, for example, ICTs (Science and Technology Institutions), TTOs (Technology Transfer Offices), Funding agency, etc.

From the next sections, we will see the literary foundation of all the constructors used in the construction of the theoretical framework.

2.4 KNOWLEDGE TRANSFER

In the past several years, Knowledge Transfer from universities to industry is an area of research that has attracted the action researchers (e.g., Agrawal, 2001; Bekkers & Freitas, 2008; Karnani, 2013; Nemanich, Banks, & Vera, 2009; Rossi, 2010).

Huber (1991) posits that knowledge transfer is the sharing of knowledge among participating members. In 1996, Knowledge Transfer was defined as the combined processes of transmitting and receiving knowledge within or between firms by Grant (1996b). Argote and Ingram (2000, p. 151) say that "Knowledge Transfer in organizations is the process through which one unit (e.g., group, department, or division) is affected by the experience of another." They states that although Knowledge Transfer in organizations involves transfer at the individual level, the problem of Knowledge Transfer in organizations transcends the individual level to include transfer at higher levels of analysis, such as the group, product line, department, or division. Knowledge Transfer in organizations manifests itself through changes in the knowledge or performance of the recipient units. Thus, Knowledge Transfer can be measured by measuring changes in knowledge or changes in performance. Some empirical studies demonstrate a positive relationship between the creation of new knowledge and the performance of a company (Bontis et al., 2002; Tippins & Sohi, 2003).

In Knowledge Transfer research, two principal levels of analysis can be discerned; one at the inter-organizational level focusing on structural and organizational processes, and one at

the intra-organizational level concerning the underlying abilities of the respective individuals to emit and absorb knowledge (Easterby-Smith, Lyles, & Tsang, 2008; Felin & Hesterley, 2007).

According to Agrawal (2001), research of Knowledge Transfer can be classified into four main categories: (1) firm characteristics, (2) university characteristics, (3) relationships between firms and universities, and (4) channels of knowledge transfer. Research into the firm characteristics category focuses attention on the firm's ability to absorb and apply university-managed research to the firm's business operations (e.g., Thomas, 2012; Veugelers & Cassiman, 2005). Research on the university characteristics category embraces university policies such as intellectual property and licensing strategies (e.g., D'Este & Perkmann, 2011; Siegel, Waldman, Atwater, & Link, 2003). Research on the relationship between universities and firms category focuses on spatial relationships and localized knowledge spillovers (e.g., Ponds, Oort, & Frenken, 2009; Wennberg, Wiklund, & Wright, 2011). And, research on the transfer channel category concentrates on the manner that knowledge is transferred from universities to firms such as licensing, consulting services, publications, personal exchange, and joint ventures (e.g., Casper, 2013; Crespi, D'Este, Fontana, & Geuna, 2011; Grimpe & Fier, 2010).

As posited by theory of Knowledge Transfer, it takes place between a source and a recipient and, the success of Knowledge Transfer depends on the characteristics of both the source and the recipient (Chang, Gong, & Peng, 2012; Ko, Kirsch, & King, 2005). In the case of this study, the source of Knowledge Transfer is the University and the recipient of Knowledge Transfer is the Industry. The focus of this study is on knowledge transfer from universities to industry through innovation department employees in service. Therefore, the first and second hypothesis is formulated as follows:

H1. Knowledge Transfer has a positive impact on Absorptive Capacity.

In the study by Tho (2017), the results revealed that the Absorption Capacity positively affects the Acquired Knowledge, but does not affect the Knowledge Transfer. But, it has been empirically confirmed by other Knowledge Transfer studies that the knowledge recipient's efforts spent on any Knowledge Transfer influence the successful absorption of that knowledge (Katz & Allan, 1982; Minbaeva, Pedersen, Björkman, Fey & Park, 2003; Szulanski, 1996).

Foss and Pedersen (2002) affirm that there is a great dependence on the existence and wealth of the transmission channel, so that there is success in the Transfer of Knowledge (in multinationals) it also depends a lot on the type of knowledge Transfer in terms of its

characteristics, such as tacit and the recipient's Absorption Capacity. The Teigland and Wasko (2009) findings support also the role that Intrinsic Motivations play in this process (Osterloh & Frey, 2000).

H2. Knowledge transfer has a positive impact on Innovation Performance.

2.4.1 Intrinsic Motivation

According to Blumenfeld, Kempner and Krajcik (2006, p. 476), "motivation sets the stage for cognitive engagement. Motivation leads to achievement by increasing the quality of cognitive engagement". Motivation is "evoked to explain what gets people going, keeps them going, and helps them finish tasks" (Pintrich, 2003, p. 104). To be motivated means to be moved to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated; whereas someone who is energized or activated toward an end is considered motivated (Ryan & Deci, 2000).

Woodworth (1918) first used the intrinsic and extrinsic terms of psychology. The first referred to an "activity driven by its own impulse," and the second to an activity "driven by some extrinsic motive". Extrinsic motivation is defined when a person does something because of a separable outcome, such as pressure or "extrinsic rewards" in the form of money or verbal feedback (e.g., compliments) (Deci, Koestner, & Ryan, 1999), while Intrinsic Motivation indicates search for an activity because it is inherently interesting or enjoyable.

Although both extrinsic and intrinsic motivation promote performance gains (Cerasoli, Nicklin, & Ford, 2014), according to Ryan & Deci (2000), only Intrinsic Motivation has been associated with improved psychological well-being, enhanced creativity and learning outcomes. Cerasoli et al. (2014), complement by saying that they also increases in the extent and quality of the effort that people put into given tasks.

In the article of Locke & Schattke (2108), they argue that the concept of Intrinsic Motivation should be limited to referring to the pleasure gained from an activity, divorced from any further elements. It means liking the doing. Thus, the third and fourth hypothesis is formulated as follows:

H3. Intrinsic Motivation has a positive impact on Knowledge Transfer.

Several scholars argue that especially Intrinsic Motivation has a positive effect on knowledge sharing (Cabrera, Collins, & Salgado, 2006; Mudambi, Mudambi, & Navarra, 2004; Osterloh & Frey, 2000). When the source and recipient are intrinsically motivated knowledge is transferred (Ko et al., 2005).

A number of studies on Intrinsic Motivation have shown that Intrinsic Motivation is more conducive to creative tasks in general and Knowledge Transfer in particular (Osterloh, Frost, & Frey, 2002). Also, Tho and Trang (2015) after research on the subject, it comes to a conclusion that Intrinsic Motivation has a positive impact on Knowledge Transfer.

This study focuses on employees' Intrinsic Motivation to Transfer Knowledge and skills acquired from Universities to Organizations. In the context of knowledge transferring from universities to organizations, employees are the source and professionals from universities the recipient. As a beneficiary, employees in service acquire knowledge and skills from Universities and, as a source, these professionals from universities give the knowledge and skills acquired in their daily work, that is, to transfer knowledge from universities to organizations. Therefore, it is more likely that employees on duty with Intrinsic Motivation from the conceptual model will apply the knowledge and skills acquired from universities to their work, as proposed by the theoretical framework.

H4. Intrinsic Motivation has a positive impact on Acquired Knowledge.

2.4.2 Acquired Knowledge

Knowledge acquisition is defined as the process of accessing and absorbing knowledge through direct or indirect contact or through interaction with knowledge sources (Inkpen & Dinur, 1998; Albino, Garavelli, & Schiuma, 1998; Hult, Ketchen Jr, & Slater, 2004).

Knowledge can be acquired, stored and used at the organizational level through the means of information management, communication, cooperation and mutual advantage, although is typically explored on an individual basis (Kogut & Zander, 1992; Eisenhardt & Santos, 2002). The term "acquisition" refers to a company's ability to identify, acquire and accumulate knowledge (internal or external) essential to its operations (Gold, Malhotra, & Segars, 2001; Zahra & George, 2002).

Li, Wei and Liu (2010), state that from a knowledge-based standpoint, knowledge has emerged as a company's most strategic resource (Grant, 1996b), and acquiring new knowledge for the outsourcing partner is one of the most cited reasons for collaboration (Levy, 2005; Li, Guo, Liu, & Li, 2008).

Acquiring knowledge, according to Mills and Smith (2011, p. 160), "can involve several aspects including creation, sharing and dissemination". Knowledge acquisition partly reflects, a subset of a company's Absorptive Capacity – more specifically, it can be viewed as a "potential capacity" reflecting a company's ability to use its knowledge to create advantage, but not ensures that knowledge is used effectively (Cohen & Levinthal, 1990). The fifth hypothesis is drawn as follows:

H5. Acquired Knowledge has a positive impact on Knowledge Transfer.

Tho (2017) found that the knowledge acquired it is a determinant of Knowledge Transfer. Thus, the knowledge and skills acquired from universities are an antecedent of Knowledge Transfer, as postulated by the SEM model.

2.4.3 Innovative Culture

According to Solís and Mora-Esquivel (2019), the Innovative Culture (CI) in teams is defined as values, beliefs and assumptions that promote innovation and are shared by the members of a group. Many authors define organizational culture as values, beliefs, assumptions, behaviors shared by members of a group or organization (Cameron & Quinn, 2011; Denison, 1996; Schein, 1983).

Some elements such as symbols, discourses, mutual experiences, myths, organizational mission are scattered, resulting in meanings about the organization's behavior, thus creating a collective identity (Janićijević, 2011; Schneider, Ehrhart, & Macey, 2013). For Ali and Park (2016), the Innovative Culture could facilitate the creation and development of new products, services or process innovation. The sense of creativity is increased when there is an Innovative Culture within a company, because it emphasizes the ability to adopt and implement new and innovative ideas (Hurley & Hult, 1998; O'Cass & Ngo, 2007; Škerlavaj et al., 2010).

The challenges of today's business environment, with their risks, uncertainties and fluctuations, require business organizations to be innovative and creative for survival and development, and an organization's innovative culture plays a key role to accomplish this task (Hurley & Hult, 1998; O'Cass & Ngo, 2007; Škerlavaj et al., 2010). This Innovative Culture

fosters the innovative capacity of all members of organization (O'Cass & Ngo, 2007; Škerlavaj et al., 2010).

Tho and Trang (2015) attest that employees of an organization will believe that the organization supports new knowledge and ideas if it has an Innovative Culture, thus creating opportunities for its employees to transfer knowledge from various possible sources. This Innovative Culture ultimately emphasizes innovation and the adoption of new ideas, processes or ways of doing tasks (O'Cass & Ngo, 2007). Thus, in this hypothesis, Innovative Culture is an antecedent of Acquired Knowledge and Knowledge Transfer.

H6. Innovative Culture has a positive impact on Acquired Knowledge.

To Tho and Trang (2015) an organization that creates and nurtures an Innovative Culture will give an opportunity for employees within the organization. They say that such an organization will foster a learning environment within the organization, encouraging its employees to invest in their learning capability. In other words, Innovative Culture emphasizes innovation and cultivates capabilities of members in an organization to adopt new ideas, processes, or new ways of performing tasks (O'Cass & Ngo, 2007). As such, Innovative Culture provides an opportunity for in-service employees to acquire more knowledge and skills from Universities to improve their capabilities.

H7. Innovative Culture has a positive impact on Knowledge Transfer.

In this study, when we talk about Innovative Culture, we are referring to the belief of employees in relation to the Innovative Culture of the organization in which they work. Employees believe that the organization supports new knowledge and ideas, due to the organization's Innovative Culture, giving rise to the application of new knowledge and skills acquired at universities in their work. In other words, the organization creates an opportunity for its employees to transfer knowledge from several possible sources, including universities, to the organization. Thus, the Innovative culture is an antecedent of Knowledge Transfer, as postulated by the SEM model.

According to Tho (2017) an "Innovative Culture, it improves Intrinsic Motivation and Acquired Knowledge, but not Knowledge Transfer".

2.5 ABSORPTIVE CAPACITY

The concept of Absorptive Capacity (ACAP) has been a relevant topic of scientific inquiry (e.g., Camisón & Forés, 2010; Jansen, Van Den Bosch, & Volberda, 2005; Zahra & George, 2002). The concept is gradually gaining acknowledgment, as a key driver of a firm's competitive advantage (Lichtenthaler, 2009). Cohen and Levinthal (1989) published a work about Absorptive Capacity, since of then; numerous theoretical and empirical studies have analyzed firms' capacity to absorb knowledge.

Camisón and Forés (2010) say that Absorptive Capacity has become one of the most significant constructs in the last twenty years precisely because external knowledge resources are so important. Is a key concept in the literature on organizations and innovation (Cohen & Levinthal, 1990).

The Absorptive Capacity's importance has been noted across many fields, like: strategic management (Lane & Lubatkin, 1998; Nahapiet & Ghoshal, 1998), technology management (Schilling, 1998), international business (Kedia & Bhagat, 1988), and organizational economics (Glass & Saggi, 1998). Zahra and George (2002) complete saying that the Absorptive Capacity concept provides adequate flexibility to be applied to different units of analysis and in a variety of research fields such as industrial organization, Organizational Learning and innovation management.

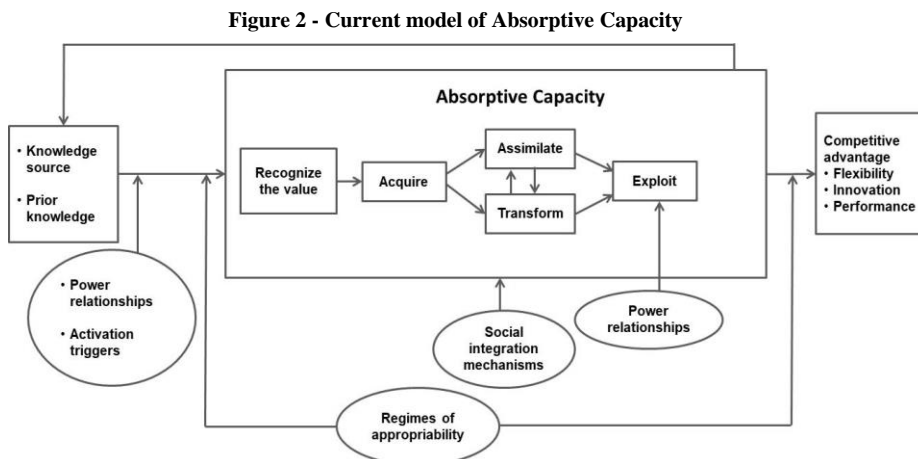
Cohen and Levinthal (1989), hold that Absorptive Capacity is a by-product of an organization's R&D efforts. But in 1990, they redefine the Absorptive Capacity construct as the capacity of a firm to value, assimilate and apply, for commercial ends, knowledge from external sources. In this second approach they consider Absorptive Capacity as a by-product not only of R&D activities, but also of the diversity or breadth of the organization's knowledge base, its prior learning experience, a shared language, the existence of cross functional interfaces, and the mental models and problem solving capacity of the organization's members. Cohen and Levinthal (1990, p. 128) refer to the capability of learning from external sources as "Absorptive Capacity" and define it as the firm's "ability to recognize the value of new information, assimilate it, and apply it to commercial ends". The concept is important because it calls attention to differences among firms in their ability to use external knowledge; thus, even if competitors are exposed to the same external technology, they will show differences in their comprehension and use of the technology in their own innovation efforts.

Later, a separation was proposed between potential Absorptive Capacity, which reflects the acquisition and assimilation of knowledge, and realized Absorptive Capacity, which reflects

the transformation and exploitation of knowledge (Zahra & George, 2002). Zahra and George (2002) link the construct to a set of organizational routines and strategic processes through which firms acquire, assimilate, transform and apply knowledge with the aim of creating a dynamic organizational capacity. In 2004, a new definition emerged, where Absorptive Capacity is defined as the ability to effectively allow companies to acquire and use external knowledge, as well as the internal capacity to affect their innovations (Daghfous, 2004; Fichman, 2004).

Afterwards, another analysis added further depth to the concept by separating value recognition, acquisition, assimilation, transformation, and exploitation of knowledge (Todorova & Durisin, 2007). The Absorptive Capacity's role, refers exactly to this focus, which enabling firms to recognize the value of new external knowledge, acquire, and assimilate this external knowledge in concert with existing knowledge stocks so as to generate commercializable outputs (Todorova & Durisin, 2007; Zahra & George, 2002).

The Figure 2 shows the result of this evolution in the absorption capacity analysis, which summarizes the current conceptualization, with the absorption capacity components discussed above appearing in boxes. The Figure 2 also shows in ovals those contingencies that previous studies acknowledged as affecting the firm's ability to integrate and transform external knowledge.



Source: Todorova and Durisin (2007).

Finally, in 2010, Camisón and Forés (2010) concluded that Absorptive Capacity is the dynamic capacity that allows firms to create value and to gain and sustain a competitive advantage through the management of the external knowledge (Camisón & Forés, 2010).

Absorptive capacities of firms can influence the effectiveness of innovation activities (Cockburn & Henderson, 1998). Chen et al. (2009) say that Absorptive Capacity appears to be one of the most important determinants of the firm's ability to acquire, assimilate, and profitably utilize new knowledge to increase its Innovation Performance. Daghfous (2004) allege that firms need to raise their absorptive capacities to acquire, assimilate, transform, and exploit knowledge which can lead to the Organizational Innovations. He continues saying that Absorptive Capacity enables firms to effectively acquire and utilize external knowledge as well as internal one which affects their abilities of innovation.

Cohen and Levinthal (1990) argued that firms with a higher general level of technological competence would have higher Absorptive Capacity, and hence measured this construct by a firm's R&D intensity. Other researchers have argued that a measure of Absorptive Capacity should be based on the relevant technological-based capabilities where there is overlap among partners (Lane & Lubatkin, 1998; Mowery, Oxley, & Silverman, 1996). In other words, Knowledge Transfer will occur more efficiently in technological areas that both partners understand well rather than in technological areas that one of the partners is not technologically competent.

Lane et al. (2006) constructed from a thorough review of the main published articles on Absorptive Capacity and defined the construct as the ability of a company to use the knowledge of the external environment through three sequential processes: (1) recognition and understanding of new knowledge externalities through exploratory learning; (2) the assimilation of valuable new knowledge through transformative learning; and (3) the use of assimilated knowledge to create new knowledge and business results through exploratory learning.

According to Camisón and Forés (2010), as in most studies of Absorptive Capacity, this definition, oriented to the learning process, introduces three of the classic dimensions of Cohen and Levinthal (1989, 1990). However, Lane et al. (2006) implicitly refer to the capacity for transformation considering that external knowledge is assimilated through transforming knowledge, combining it with existing knowledge.

Nevertheless, Todorova and Durisin (2007) question whether the assimilation of knowledge and the capacities of transformation of knowledge are two different sequential processes. For them, the capacity for transformation is not the phase that follows assimilation,

but rather an alternative process, thus defining the Absorptive Capacity as the ability of a company to evaluate, acquire, assimilate or transform and exploit external knowledge. Todorova and Durisin (2007) argue that when external knowledge conforms to the company's cognitive schemas, the assimilation of knowledge leads directly to its exploration or application, without this knowledge having to be previously transformed. For Camisón and Forés (2010), in contrast, when external knowledge or ideas do not fit the existing structures of internal knowledge, knowledge or ideas are transformed. Affirming that in this case, the cognitive structures of individuals must be modified to adapt an idea or situation that they can not assimilate.

Though, Camisón and Forés (2010) say that contrast with Todorova and Durisin (2007) when a company decides to acquire external knowledge, regardless of whether such knowledge relates to the base and structure of the company's existing knowledge, knowledge must be understood, analyzed and codified, since the knowledge comes from very different cultures, systems and organizational practices. They reinforce that this phase comes before the Acquired Knowledge can be diffused and integrated to the existing internal routines, processes and knowledge of the firm.

The condition of complementarity does not allow an adequate definition of the constructs and therefore does not meet the requirement of unambiguous definitions (Wacker, 2004). The value contribution of the work of Camisón and Forés (2010) is based on an appropriate definition by factorial analysis serving as the basis for the covariance analysis shared by dimensions and components under the latent model (Law, Wong, & Mobley, 1998; Cheung, 2008).

Following the line of authors who uphold the need to study Absorptive Capacity from a dynamic or process-oriented perspective (Lane et al., 2006; Zahra & George, 2002), and in accordance with the Camisón and Forés (2010) interpretation of the construct, four different dimensions—acquisition, assimilation, transformation and application—exhaustively cover the domain of Absorptive Capacity (see Table 2).

The creation of knowledge is important, but the conversion of this knowledge into new products is the basis of superior performance (Barton, 1995; Nonaka & Takeuchi, 1995a). In this sense, to Camisón and Forés (2010) both external learning capacity (Absorptive Capacity) and internal learning capacity (internal knowledge creation capacity) influence innovation capacity, which in the final instance is what determines innovative performance. Although both learning capacities are considered as two interrelated capacities of change (Levinthal, 1991), they are based on differentiated processes, routines and strategies.

Table 2 - Dimensions of Absorptive Capacity

Dimensions	Definition	Antecedents
Acquisition	Acquisition capacity is a firm's ability to locate, identify, value and acquire external knowledge that is critical to its operations	Lane and Lubatkin (1998), Zahra and George (2002), Liao et al. (2003)
Assimilation	Assimilation capacity refers to a firm's capacity to absorb external knowledge. This capacity can also be defined as the processes and routines that allow the new information or knowledge acquired to be analyzed, processed, interpreted, understood, internalized and classified.	Szulanski (1996), Zahra and George (2002)
Transformation	Transformation capacity is a firm's capacity to develop and refine the internal routines that facilitate the transference and combination of previous knowledge with the newly acquired or assimilated knowledge. Transformation may be achieved by adding or eliminating knowledge, or by interpreting and combining existing knowledge in a different, innovative way.	Kogut and Zander (1992), Van den Bosch et al. (1999)
Application	Application or exploitation capacity refers to the organizational capacity based on routines that enable firms to incorporate acquired, assimilated and transformed knowledge into their operations and routines not only to refine, perfect, expand and leverage existing routines, processes, competences and knowledge, but also to create new operations, competences, routines, goods and organizational forms.	Lane and Lubatkin (1998), Zahra and George (2002)

Source: Camisón and Forés (2010)

Following Zahra and George (2002) and according to Camisón and Forés (2010), these four dimensions are classifiable into two components: potential Absorptive Capacity (acquisition and assimilation) and realized Absorptive Capacity (transformation and application). Zahra and George (2002) state that potential Absorptive Capacity affects competitive advantage through management flexibility and the development of resources and capacities, while realized Absorptive Capacity does so through the development of new products and processes.

To Garner and Ternouth (2011) only recently the concept of Absorptive Capacity has been seen as a useful lens through which to understand the necessary conditions for successful knowledge transfer between universities and companies and the variation in capacity of different places to create and absorb ideas and support innovation. They say that:

Universities are important actors in any innovation ecosystem however an understanding of the complexity of the role which such institutions may play has not always been recognized by local economic development agencies. Too often, universities are seen as "suppliers" to the local economy, delivering an educated workforce or undertaking research tasks on commission. True innovation ecologies recognize the breadth of functions which universities can play from their "public space" role to being key businesses in their own right. Thriving innovation ecologies can benefit from a broad spectrum of engagement with their local universities. As generators of research; educators of talented students; businesses and social institutions in the community, universities can bring a wealth of

resources to support innovation and to assist the level of Absorptive Capacity for innovation in the city-region. (Garner & Ternouth, 2011, p. 11)

Garner and Ternouth (2011) also affirm that Absorptive Capacity may be deliberately supported as a strategy for promoting economic development by public sector agencies through exploiting the research base in higher education. García-Morales, Lloréns-Montes and Verdú-Jover (2008) declare that Absorptive capacity stimulates areas of knowledge that are intertwined, such as Organizational Learning and innovation. Thus, in this hypothesis, Absorptive Capacity is an antecedent of Organizational Learning.

H8. Absorptive Capacity has a positive impact on Organizational Learning.

2.6 TRANSFORMATIONAL LEADERSHIP

It was Burns (1978) who first developed the theory of Transformational Leadership. In 1999, Senge et al. (1999) stated that transformational leaders are those capable of empowering human resources and enabling change, thereby improving the organization's performance in global markets.

Transformational Leadership highlights fulfilling basic needs and meeting higher desires while inspiring followers to provide newer solutions and create a better working environment (Chandrashekar, 2004; Jue, 2004). Seaver (2010) defined Transformational Leadership as a style of leadership where one or more people commit with others in such a way that leaders and followers increase to higher levels of motivation and morality. He complements by stating with the goal of something valued exchange, transactional leadership occurs when a person takes the initiative to make contact with other people. To Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi and Rezazadeh (2013), Transformational Leadership is a “managerial style that seeks to inspire employees by charismatic speech, motivation, and intellectual stimulation.”

In order to create the essential competences necessary for improve Organizational Learning, Transformational Leadership today can play a key role in empowering individuals and organizations to create, explore, renew, and apply knowledge (Aragón-Correa, García-Morales, & Cordon-Pozo, 2007).

Importantly, because of its strong influence on organizational functions Transformational Leadership has gained in importance. Empirical studies have shown that as charismatic leaders, transformational leaders effectively collaborate with employees, to achieve

better Organizational Performance and innovative capacity, even in uncertain environments (Waldman, Ramirez, House, & Puranam, 2001; Ensley, Pearce, & Hmieleski, 2006; Jansen, Vera, & Crossan, 2009).

The transformational leaders more often convey to employees what they need to accomplish as a group and inspire dedication among employees to pursue these organizational goals, in addition to being trusted and advocates of ethical principles (Bass & Riggio, 2006). They guide employees to fortify their intellectual capabilities and challenge their supposition to induce creative thinking. These leaders guide their employees to understand their personal goals, understanding that employees' needs must be met first to develop a committed and inspired workforce (Bass, Avolio, Jung, & Berson, 2003).

Ghasabeh, Soosay and Reaiche (2015) conclude that:

Hence, transformational leadership theory sheds light on the critical role of employees' attitudes and values in implementing changes at the organizational level, and features effective organizational change as a product of developing relationships with subordinates.... Transformational leadership instills major changes at the organizational level through changing attitudes and assumptions at the individual level and creating collective. Moreover, this leadership facilitates organizational innovation and learning, and generates a shared and inspiring vision for future. (Ghasabeh et al., 2015, p. 464)

Bass (1985) discovered four dimensions of Transformational Leadership: idealized influence, individualized consideration, intellectual stimulation, and inspirational motivation. Idealized influence aims to develop a shared vision and improve relationships with followers (Canty, 2005); while individualized consideration focuses on identifying employees' individual needs and empowering followers to create a learning climate (Lowe, Kroeck, & Sivasubramaniam, 1996) and mobilize their support for organizational level goals (Osong, 2006); Intellectual stimulation, on the other hand, drives knowledge sharing within the company to generate more innovative ideas and solutions. And inspiring motivation focuses on encourage human resources, thereby setting a higher level of desired expectations for them.

More recently, Dinh et al. (2014) did research that concluded that Transformational Leadership theory, compared to other leadership theories, such as trait theory, behavioral theory, and situational theory, is still one of the most dominant paradigms. Transformational Leadership was measured by the scales developed by Podsakoff, Mackenzie and Bommer (1996). Thus the hypotheses of the study are:

H9. Transformational Leadership has a positive impact on Absorptive Capacity.

Through intellectual stimulation, transformational leaders encourage employees to rethink their work pattern and develop new working methods (Podsakoff et al., 1990), in addition to promoting new ways of mixing new ideas with available knowledge, as needed in the step knowledge transformation (Zahra & George, 2002). By developing new skills and decreasing cognitive inflexibility among senior management, the knowledge-based theory proposes that Absorptive Capacity can substantially improve a company's ability to identify and discover new opportunities (Zahra, Filatotchev, & Wright, 2009; Espejo & Dominici 2017).

Consistent with the theory of strategic leadership (Hernandez, Eberly, Avolio, & Johnson, 2011), it has been shown that the behavior of transformational leaders generates recognition, achievement and examination of external knowledge (Li, Shang, Liu, & Xi, 2014). To Shafique and Kalyar (2018) transformational leaders reflect a clear image of the future through articulation of the vision and focus on the importance of knowledge transformation and exploitation. For them, it is the job of employees to implement knowledge commercially, according to the leader's vision using knowledge exploration. Thus, absorptive capacity is hoped and also found (Flatten, Adams, & Brettel, 2015) to be positively affected by Transformational Leadership.

H10. Transformational Leadership has a positive impact on Organizational Learning.

Transformational leadership and Organizational Learning culture were considered effective contextual factors in the Organizational Learning process based on theories, numerous models of Organizational Learning and previous studies (Nevis, DiBella, & Gould, 1997; Gephart & Marsick, 1996; Goh, 1998; Neeffe, 2001; Willcoxson, 2001; James, 2003; Hoveyda, 2007). Empirical research shows us that the result is consistent in the relationship between Transformational Leadership and Organizational Learning programs (Leithwood, Leonard, & Sharratt, 1998; Lam, 2002; Chang & Lee, 2007; Abbasi & Zamani-Miandashti, 2013). Also, the discoveries of Noruzy et al. (2013) are: Transformational Leadership directly influenced Organizational Learning and Knowledge Management. The relationship between Transformational Leadership and Organizational Learning can be positive confirmed by many other studies (Aragón-Correa et al., 2007; Snell, 2001). Amitay, Popper and Lipshitz (2005) showed Transformational Leadership was significantly related to Organizational Learning.

Liao, Fei and Liu (2008) and Aragón-Correa et al. (2007) reported that Transformational Leadership had a direct and positive influence on Organizational Learning and an indirect influence on Organizational Innovation through Organizational Learning in manufacturing companies.

H11. Transformational Leadership has a positive impact on Organizational Innovation

Leadership style has been highlighted as a strategic factor influencing innovation and knowledge (Nonaka & Takeuchi, 1995a; Senge, Kliener, Roberts, Ross, & Smith, 1994). It was proposed that transformational leaders promote higher performance in organizational units that are open to change and flexible, that is, in an innovative climate (Bass, 1985).

Jung, Chow and Wu (2003) established positive effect of Transformational Leadership on firm's innovation. Gumusluouglu and Ilsev (2009) claimed Transformational Leadership to be a successful determinant of Organizational Innovation. Equally, empirical studies exhibited the effect of Transformational Leadership on Organizational Innovation (Chang, 2016; Tajasom, Hung, Nikbin, & Hyun, 2015). Also, Transformational Leadership positively influenced Organizational Innovation and Organizational Performance of manufacturing firms (Noruzy et al., 2013).

H12. Transformational Leadership has a positive impact on Knowledge Management.

In the literature, the relationships between Transformational Leadership and Knowledge Management factors are extensively examined (Politis, 2001, 2002; Bryant, 2003, Crawford, 2005). In Vincent's study, he demonstrates that Transformational Leadership was significantly related to Knowledge Management (Vincent, 2006). Empirical studies exhibited the effect of Transformational Leadership on Knowledge Management (Birasnav, 2014; Bryant, 2003; Han, Seo, Yoon, & Yoon, 2016).

Transformational Leadership positively and indirectly influenced Organizational Innovation through Organizational Learning and Knowledge Management (Noruzy et al., 2013).

H13. Transformational Leadership has a positive impact on Organizational Performance

Empirical studies exhibited the effect of Transformational Leadership on Organizational Performance (Noruzy et al., 2013).

Transactional Leadership was suggested by Bass and Bass (1985) as the core component of effective leadership behavior that could influence organizational performance.

On the other hand, Howell and Avolio (1993) claim that Transformational Leadership, unlike “transactional” leadership, stimulates innovation and knowledge and generates advantages for organizational performance.

Transformational Leadership influences learning positively, challenging the existing level to influence Organizational Innovation and improve performance (Schön & Argyris, 1996; Glynn, 1996; Hurley & Hult, 1998; Senge et al., 1994). Moreover Lewin, Lippitt and White (1939) states that Transformational Leadership is one of the important elements of successful leadership behavior to achieve Organizational Performance.

2.6.1 Organizational Learning

Organizational Learning is “the process of improving actions through better knowledge and understanding” (Fiol & Lyles, 1985, p. 803). Specifically, Organizational Learning is a social process. Within a company, employees interact by building meaning and knowledge about action-outcome relationships and the effects of the organization's context (learning environment) on those relationships (Brown & Duguid, 1991; Duncan, 1979).

Templeton, Lewis and Snyder (2002) defined Organizational Learning as the set of actions (knowledge acquisition, information distribution, information interpretation, and organizational memory) that influence positive organizational changes within the organization, which can be intentionally and involuntarily. In the same year, was defined by Zollo and Winter (2002) as a collective capacity based on experiential and cognitive processes and involving knowledge acquisition, knowledge sharing and knowledge utilization.

Organizational Learning systems are built to transfer learning in the form of values, norms, acceptable behaviors, routines, practices and structure to future employees and to interpret the business environment for business strategy formulation (Fiol & Lyles, 1985).

In the organizational learning the organizations create cognitive systems and build organizational memories based on a continuous process of making changes in the performing of jobs and thinking, either at individual, group, or institutional level, like individual employees whose learning behaviors are shaped by their own personalities and beliefs (Crossan, Lane, & White, 1999). In their studies, Crossan et al. (1999) state that Organizational Learning is conceived by two streams: (1) a feed-forward flow that changes learning that is taking place at the individual employee level to the group level and the group level to the organizational level through 4Is processes (i.e. intuition, interpretation, integration and institutionalization) and (2) a feedback flow that transfers learning, through the same processes 4Is, at the organizational level to the group level and the group level to the individual employee level. In the intuition process, learning begins in each employee's subconscious mind as new insights are often interpreted, and these crystallized insights form cognitive maps that become an individual stock of employees (Bontis, Crossan, & Hulland, 2002). During the processes of interpretation and integration, these individuals share their knowledge / stock with a group of employees through dialogue, and these groups integrate the views of all members and generate shared understandings (Bontis et al., 2002; Vera & Crossan, 2004). Finally, organizations institutionalize these shared understandings and provide a final form for Organizational Learning, reflected in their practices, routines, and organizational structure (Vera & Crossan, 2004).

To McDonough III (2000) transformational leaders must be able to create teams and provide them with direction, energy, and lead them to create the processes of change and especially Organizational Learning. Berson, Nemanich, Waldman, Galvin and Keller (2006) indicated that an opportunity to uncover a detailed picture of the role of leaders in facilitating Organizational Learning is provided by the specification of learning processes at different levels of analysis. They showed that leadership facilitates Organizational Learning to ultimately affect Organizational Performance.

Argote (2013) account Organizational Learning theory as a meta-theory that considers the socio-organizational context of learning about new knowledge, the individual level factors that influence learning about new knowledge, the macro-environmental influences on knowledge application and learning, and the impact of the nature of the knowledge or innovation on subsequent learning processes. Birasnav, Chaudhary and Scillitoe (2019, p. 144) report that Organizational Learning “originates from the employee learning, which is evolved from the subconscious mind of an individual employee and modified at various levels of organization by the internal and external environment”.

Organizational learning was measured by the scales developed by Garcia-Morales et al. (2008). Therefore this study proposes that hypothesis:

H14. Organizational Learning has a positive impact on Knowledge Management.

In the past 20 years, the field of Organizational Learning and Knowledge Management has received special care of researchers and practitioners (Easterby-Smith & Lyles, 2011). According to Aragón-Correa et al. (2007) and Zagoršek, Dimovski and Škerlavaj (2009), Organizational Learning has had a strong impact on Knowledge Management. The discoveries of Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi and Rezazadeh (2013) demonstrate that Organizational Learning directly and positively influenced the Knowledge Management of manufacturing firms.

H15. Organizational Learning has a positive impact on Organizational Innovation.

In a knowledge intensive industry, Stata (1989) regards innovation as a result of individual and Organizational Learning and as the only source of lasting competitive advantage. Furthermore, different Organizational Learning styles will result in different innovation activities (McKee, 1992).

Argyris and Schon (1997) suggest that Organizational Learning would enhance the innovative capacity of an organization. In 1999, was funded by Gerybadze and Reger (1999) that Organizational Learning has a positive relationship with Organization Innovation on globalization of R&D. On the other hand, in Weerawardena, O'Cass and Julian (2006) studies the results also show that learning and internally focused learning influences innovation and that innovation influences a brand's performance. In addition, Aragón-Correa et al. (2007) proposed a research finding that leadership style, an individual feature, and Organizational Learning, a collective process; simultaneously and positively affect firm innovation.

The findings of Greve (2005) studies reveal that Organizational Learning and Organizational Innovation are related. The results of the study by Liao and Wu (2010) show that there is sufficient evidence to support a relationship between Organizational Learning and Organizational Innovation.

Organizational Learning and Knowledge Management directly influenced Organizational Innovation (Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi, & Rezazadeh, 2013).

H16. Organizational Learning has a positive impact on Organizational Performance.

For Cyert and March (1963) performance improvements are products of adaptive learning, which arise through accumulated experience and allow organizations to consciously adapt their work routines. Aragón-Correa et al. (2007) concluded that there was positive relationship between Organizational Learning and Organizational Performance. Argote and Miron-Spektor (2011) claim that Organizational learning is related to Organizational Performance.

Some researchers defined Organizational Learning as a dynamic process of creation, acquisition and integration of knowledge, aiming at the development of resources and capacities that contribute to a better Organizational Performance (López, Peón, & Ordás, 2004). Evidence that the whole process of Organizational Learning produces better performance was provided by Darroch and McNaughton (2003).

Organizational Learning is a foundation for gaining a sustainable competitive advantage and a key variable in the enhancement of Organizational Performance (Brockmand & Morgan, 2003; Dodgson, 1993; Fiol & Lyles, 1985; Garwin, 1993; Gnyawali, Steward, & Grant, 1997; Nevis, DiBella, & Gould, 1997; Stata, 1989).

Five stages were distinguished by Tippins and Sohi (2003) within the Organizational Learning process (information acquisition, information dissemination, shared interpretation, declarative memory and procedural memory) have a positive effect on firm performance. Great number of studies show that cultures that promote Organizational Learning improve individual, team, and Organizational Learning, and as a result, improve Organizational Performance (Egan, Yang, & Bartlett, 2004; Ellinger, Ellinger, Yang, & Howton, 2002).

Organizational Learning and Organizational Innovation directly influenced Organizational Performance among manufacturing firms (Noruzy, Dalfard, Azhdari, Nazari-Shirkouhi, & Rezazadeh, 2013).

Some previous studies emphasize the main role of innovation (Aragón-Correa et al., 2007; Jiménez-Jiménez & Sanz-Valle, 2011; Brown & Eisenhardt, 1995; Damanpour, 1991; Thornhill, 2006; García-Morales, Lloréns-Montes, & Verdú-Jover, 2008); Organizational Learning (Aragón-Correa et al., 2007; Bontis et al., 2002; Keskin, 2006; Ussahawanitchakit, 2008) and Transformational Leadership (DeGroot, Kiker, & Cross, 2000; Hancott, 2005; Boerner, Eisenbeiss, & Griesser, 2007) in improving Organizational Performance.

H17. Organizational Learning has a positive impact on Innovation Performance.

Hung, Lien, Yang, Wu and Kuo (2011, p. 215) say that “from the perspective of Organizational Learning, the concrete output via knowledge capacity promotes Innovative Performance”.

Previous research suggests that Organizational Learning affects Innovation Performance (Calantone, Cavusgil, & Zhao 2002; Newey & Zahra 2009). Liao, Fei and Liu (2008) and Aragón-Correa et al. (2007) reported that Organizational Learning directly influenced innovation.

Examining the impact of Organizational Learning on performance, through the implementation of a market-oriented perspective, shows that Organizational Learning improves sales, profit growth, customer satisfaction and innovation (Hung, Lien, Yang, Wu, & Kuo, 2011).

2.6.2 Knowledge Management

Donate and de Pablo (2015, p. 360) considers Knowledge Management “a well-established discipline in the academic field and in the business world”. For them, the main purpose of using Knowledge Management (KM) in an organization, is to raise awareness of one's knowledge, individually and collectively, by shaping itself to make the most effective and efficient use of the knowledge that the company has or is able to obtain.

Based on Knowledge Management principles, organizations around the world, with the goal of improving business process efficiency, develop and implement Knowledge Management initiatives to increase the productivity and quality of their services, and find news solutions and products for their clients (Nam Nguyen & Mohamed, 2011).

In the nineties, Knowledge Management was discussed in more detail and is considered a process that promotes the flow of knowledge between individuals and groups within the organization, comprising four main steps: knowledge acquisition, storage, distribution and use (Durst & Edvardsson, 2012; Liao, Chuang, & To, 2011; Argote et al., 2003; Cormican & O'Sullivan, 2003).

What Jennex (2006) believe is that institutions or organizations become much more effective if they are capturing, sharing, retaining, and reusing organizational knowledge to generate a successful business environment. Hou, Sun and Chuo (2005) confirm that many organizations have recognized the importance of creating, extracting and managing efficient business knowledge.

In order to reach sustainability and improve innovation capacity and responsiveness to environmental changes (Teece, 2007; Thrassou & Vrontis, 2008), Knowledge Management refers to the organization processes and leveraging of the company's collective knowledge (Argote & Ingram, 2000; Davenport & Prusak, 1998). More specifically, the effect of Knowledge Management practices is naturally drawn to the relationship between Knowledge Management, innovativeness and firm performance (Darroch, 2005; López-Nicolás & Meroño-Cerdán, 2011).

In Knowledge Management, the end result of its aspects is innovation, which, in turn, improves Organizational Performance and thus increases competitive advantage (Andreeva & Kianto, 2011; Zack, McKeen, & Singh, 2009). Through an enabling environment for enhancing innovation and Organizational Performance, Knowledge Management is a discipline and function in which knowledge is created, acquired, shared, codified and utilized (Andreeva & Kianto, 2011; Hajir, Obeidat, Al-dalahmeh, & Masa'deh, 2015; Zack, McKeen, & Singh, 2009).

There are a large number of studies that have found a positive impact of Knowledge Management processes, practices and infrastructure on innovation (e.g. Soto-Acosta, Colomo-Palacios, & Popa, 2014; Al-Husseini & Elbeltagi, 2015; Chen, Tao, & He, 2012 ; Lai, Hsu, Lin, Chen, & Lin, 2014; Shu, Page, Gao, & Jiang, 2012; Zheng, Zhang, & Du, 2011). Knowledge Management has already been recognized as a required management process to reach competitive advantage (Argote & Ingram, 2000; Dias & Bresciani, 2006).

Knowledge Management storage activities allow the company to maintain an organizational memory, these include: organizing, structuring and retrieving organizational knowledge, which encompasses knowledge that resides in various forms such as written documentation, information stored in electronic databases, coded human resources (Alavi & Tiwana, 2003; Zack, 1999). They say that knowledge is stored in specialist systems, documented organizational procedures, and processes or tacit knowledge obtained by individuals and networks of individuals.

In Knowledge Management there are two main dimensions that are essential, namely enablers and processes. Enablers are mechanisms that stimulate knowledge creation, sharing and protection, and provide the infrastructure necessary to improve the knowledge processes (Yeh, Lai, & Ho, 2006), facilitating Knowledge Management activities, such as codifying and sharing among individuals and teams (Ichijo, Von Krogh, & Nonaka, 1998). In turn, Knowledge Management processes refer to the structured coordination of managing knowledge in, such as knowledge creation, sharing, storage, and application (Lee & Choi, 2003).

Regarding the recognition of KM's contributions to the overall success of an organization, Alavi and Leidner (2001) point out that the use of Knowledge Management practices, often based on information and communication technologies (ICTs), makes it possible to obtain positive organizational outcomes, such as improved communication and higher levels of employee engagement, efficiency and time to solve problems, more market-friendly financial performance, best marketing practices, and improved project team performance. Knowledge management was measured by using the scales developed by Gold et al. (2001). Thus, we propose the following hypotheses as follows:

H18. Knowledge Management has a positive impact on Innovation Performance.

Darroch and McNaughton (2002) conclude that Knowledge Management generation practices generally share an association with innovation performance. Donate and de Pablo (2015, p. 367) proposed, “when a firm has a greater tendency toward a knowledge-oriented leadership position, this firm develops and supports a larger volume of Knowledge Management initiatives, which, in turn, positively affect its Innovation Performance”.

H19. Knowledge Management has a positive impact on Organizational Innovation.

Some studies suggest that Knowledge Management is positively related to Organizational Innovation (Aragón-Correa et al., 2007). Darroch (2005) and Liao and Wu (2010) indicated that Knowledge Management is positively related to Organizational Innovation. Knowledge Management plays a mediating role in the relationship between organizational culture, structure, strategy, and organizational effectiveness (Zheng, Yang, & McLean, 2010).

Knowledge Management and Organizational Learning affected Organizational Performance indirectly by Organizational Innovation (Noruzy et al., 2013).

2.7 ORGANIZATIONAL INNOVATION

Organizational Innovation refers to successful implementation within the organization of the creation or adoption of an idea or behavior (Amabile, 1998; Damanpour, 1996). Organizational Innovations, according to the Oslo Manual (2005), aiming to improve their efficiency, productivity, profitability, flexibility and creativity using disembodied knowledge, are innovations involving changes in firms' routines. Organizational Innovation refer to the

organizational changes over time, including new business practices and procedures, new Knowledge Management systems to upgrade the use or exchange of information, learning and knowledge abilities, adaptation of organizational methods for superior efficiency and adaptation of management models and structure to improve external relationships.

Organizational Innovation is described by a variety of definitions. Birkinshaw, Hamel and Mol (2008, p. 829), define it as “the generation and implementation of a management practice, process, structure, or technique that is new to the state of the art and is intended to further organizational goals”. In this context, Organizational Innovation ends up stimulating or allowing organizational changes, thus facilitating the renewal, adaptation and effectiveness of the organization (Damanpour & Aravind, 2012).

The definition proposed by Damanpour and Aravind (2012, p. 431), is the definition adopted in this research. For them, the Organizational Innovation refers to “new approaches in knowledge for performing the work of management and new processes that produce changes in the organization’s strategy, structure, administrative procedures, and systems”, which should be good to the organization’s teamwork, with information sharing, coordination, collaboration, learning and innovativeness (Gunday, Ulusoy, Kilic, & Alpkan, 2011).

Damanpour and Evan (1984) speak of an innovation that occurs in an organization's social system, the “administrative innovation,” (e.g., new rules, functions, procedures, and structures); On the other hand, Hamel (2006, p. 4) refers to the term “management innovation” as “a marked departure from traditional management principles, processes and practices or a departure from customary organizational forms that significantly alter the way the work of management is performed”.

Each of the various disciplines (sociology and management), of which organizational theory is cross-sectional, take a different perspective and use different types of data and indicators (Lam, 2004). Thus, reflecting on the concept of Organizational Innovation, this ends up covering a broad scope of strategic, structural and behavioral dimensions (Simao & Franco, 2018). For firms as they seek to improve their productivity, enrich the quality of customer supply and retain competitiveness, the introduction of Organizational Innovation with new management practices is an important issue (Ichniowski, Shaw, & Crandall, 1995; Pil & MacDuffie, 1996).

We can say that there is a tendency to combine Organizational Innovation with organizational change, assuming that change itself is fatally innovative (Lam, 2004). Organizational Innovation, which involves introducing novelty into the organization, thus expresses a particular form of organizational change (Birkinshaw et al., 2008).

Some authors believe that innovative organizations are smart and creative, and have high ability to learn effectively as well as develop new knowledge (Nonaka & Takeuchi, 1995a; Woodman, Sawyer, & Griffin, 1993). In this context, many literature scholars investigating the determinants of innovation have identified sources of knowledge as a crucial success factor in introducing Organizational Innovations (Mol & Birkinshaw, 2009).

The success of market innovations can be positively impacted by Transformational Leadership (Gumusluoğlu & Ilsev, 2009). Within the organizational context, transformational leaders can increase innovation and can use inspired motivation and intellectual stimulation, important factors for Organizational Innovation (Elkins & Keller, 2003).

In some studies, manufacturing firms have been talk about the relationship between Organizational Learning and Organizational Innovation, as well as between Knowledge Management and Organizational Innovation (Noruzy et al., 2013).

Organizational Innovation has been demonstrated by several studies, which are positively influenced by Transformational Leadership (Gumusluoğlu & Lisev, 2009; Jung et al., 2003).

The growing focus on Organizational Innovation may be due, in part, to the increase realization that innovative approaches to management and organization conduct firm performance (Volberda, Van Den Bosch, & Mihalache, 2014).

The positive effects of Organizational Innovation on performance results are supported by several studies (Camisón & Villar-López, 2014; Damanpour, Walker & Avellaneda, 2009). Further reinforcing this relationship, some other scholars argue that Organizational Innovation can provide long-term competitive advantage because it is a valuable, rare, inimitable, and company-specific resource (Hamel, 2006; Mol & Birkinshaw, 2009). Organizational Innovation was measured by using the scales developed by Miller and Friesen's (1983). Therefore, it is hypothesized that:

H20. Organizational Innovation has a positive impact on Innovation Performance.

Hervas-Oliver, Sempere-Ripoll and Boronat-Moll (2014) declare that “the production-oriented Innovative Performance is amplified by introducing Organizational Innovation, with a significant and positive relationship”.

H21. Organizational Innovation has a positive impact on Organizational Performance.

Various studies show in their results that Organizational Innovation positively influences Organizational Performance (Aragón-Correa et al., 2007; Nam, 2007; García-Morales et al., 2008; Walker, 2004; Damanpour, 1991; Gopalakrishnan, 2000).

2.7.1 Innovation Performance

The open innovation (OI) literature suggests that firms can improve their innovation performance by learning from external actors (Faems, Van Looy, & Debackere, 2005). Caputo, Lamberti, Cammarano and Michelino (2016) reported that there are a considerable number of literatures that prove that openness to external sources of knowledge helps to boost Innovation Performance. Specifically regarding the degree of innovation novelty, Chiang and Hung (2010) and Parida, Westerberg and Frishammar (2012) realized that open innovation input activities have a positive and significant effect in the incremental and radical Innovation Performances. Similarly, Ebersberger, Bloch, Herstad and Van De Velde (2012) argued that open innovation practices have a positive impact on both the ability to innovate what is new and on the actual Innovation Performances.

When sales of new products in the market are accounted for, Caputo et al. (2016) state that Barge-Gil (2013) proved that an open strategy works better than a semi-open strategy, which in turn works better than a closed strategy. Still in their studies, Caputo et al. (2016) reported that Huang and Rice (2009) found that Innovation Performance improves with online engagement, but decreases as a result of technology purchase. In addition, Caputo et al. (2016) also state that Hwang and Lee (2010) have argued that the performance of radical innovation is not explained by the breadth or depth of external knowledge input.

Also Garcia Martinez, Lazzarotti, Manzini and Sánchez García (2014) suggested that a wide and deeply open approach allows businesses to gain additional value. Collaborating even more, Cheng and Shiu (2015) allege that the focus on input activities increases radical Innovation Performances, but prevents incremental innovations, while the focus on output processes produces the opposite effects.

According to Caputo et al. (2016), the balance between positive effects of external links to innovation and the potential for excessive research led Laursen and Salter (2006) and Berchicci (2013) to expect an inverted U-shaped relationship between the amplitude/depth of innovation bonds or R&D outsourcing, and Innovation Performance, which was confirmed by their empirical analysis.

Lazzarotti, Manzini and Pellegrini (2010) showed that innovation is positively related to the variety of partners with whom the company cooperates, but there is no significant relationship when opening the innovation pipeline. Wagner (2012) observes that only customers, suppliers and competitors contribute to Innovation Performance, while universities and consultants as sources of innovation do not seem to have any impact. Similarly, Inauen and Schenker-Wicki (2011) found that opening to different external players can have positive, negative or insignificant effects on Innovation Performance.

Based on these previous arguments, Caputo et al. (2016) (see Table 3) believe that opening a company's borders allows great benefits in terms of Innovation Performance, but only up to a certain degree, because it relies heavily on outsourcing external technology, which increases research, coordination and monitoring of costs.

Table 3 - Literature contributions on the relationship between Open Innovation and Innovation Performance

Study	Metrics(s)	Effect
Chiang and Hung (2010)	External search breadth and depth	Positive
Ebersberger et al. (2012)	Open innovation breadth and depth	
Parida et al. (2012)	Technology scouting; vertical technology collaboration; horizontal technology	
Barge-Gil (2013)	Closed; semi-open; open; ultraopen	
Garcia Martinez et al. (2014)	Collaboration breadth and depth	
Huang and Rice (2009)	Networking	Positive
	Technology buy-in	Negative
Hwang and Lee (2010)	External search breadth	Inverse U-shape
	External search depth	Null
Lazzarotti et al. (2010)	Partner variety	Positive
	Phase variety	Null
Inauen and Schenker-Wicki	Customers; suppliers; competitors; universities	Positive
	Cross-industry firms	Negative
	Consulting firms	Null
Wagner (2013)	Customers; suppliers; competitors	Positive
	Consultants; universities	Null
Cheng and Shiu (2015)	Inbound and outbound activities	Both positive and negative
Laursen and Salter (2006)	External search breadth and depth	Inverse U-shape
Berchicci (2013)	External R&D	

Source: Caputo et al. (2016)

The success of collaborations with scientific partners in terms of Innovation Performance is still debated, despite this favorable evidence, (Laursen & Salter, 2006; Greitzer, Pertuze, Calder, & Lucas, 2010; Drechsler & Natter, 2012; Du, Leten, & Vanhaverbeke, 2014). Lazzarotti, Manzini, Nosella and Pellegrini (2016) affirm that the cultural reasons are usually identified as the possible obstacles to effective collaboration. Very often, promising outcomes

from collaboration fail to translate into tangible impacts for the companies involved (Greitzer et al., 2010).

Lazzarotti et al. (2016, p. 142) continue saying that "the reasons reside in the fact that science-based partners have their own goals, management style and culture, which may sometimes conflict with those characterizing firms". For instance, what is difficult for firms to influence is that the researchers at universities perform their activities at a more leisurely pace, and they typically operate in environments with more autonomy, freedom to exchange knowledge and publish research findings, and with room for improvisation (Du et al., 2014).

In the 1990s, Cohen and Levinthal (1990) showed that firms' Absorptive Capacity and therefore the potential to profit from technological collaborations are drastically influenced by the cultural context and the knowledge, skills and competences available. It is argued that the innovative performance of collaborations is strongly influenced by the social and cultural context. Thus, was proposed:

H22. Innovation Performance has a positive impact on Organizational Performance.

Considering the relationship between Innovation Performance and Organizational Performance, several studies reported that a company's innovation performance could influence the organization's performance (Cuneo & Mairesse, 1984; Lichtenberg & Siegel, 1991; Scherer, 1993; Griliches, 1994; Griffin & Page, 1996; Griliches & Mairesse, 1998; Wakelin, 2001; Tsai & Wang, 2004; Lin & Chen, 2005).

H23. Innovation Performance has a positive impact on Competitor Performance.

Empirical studies on the effects of competition on firm Innovation Performance are rare, despite the growing popularity of competition in both the academic and business arenas (Bengtsson, Eriksson, & Wincent, 2010; Walley, 2007; Yami, Castaldo, Dagnino, & Le Roy, 2010). We find the opposite, the impact of competition on innovation and yet, there are inconsistent conclusions about that. For example, while Quintana-García and Benavides-Velasco (2004) report positive effects of competition on innovation, Nieto and Santamaría (2007) report a negative relationship between alliances with competitors and Innovation Performance, and Knudsen (2007) finds no evidence that competition leads to an increase in Innovation Performance. Huang and Yu (2011) showed that competitive R&D collaborations

have a positive moderating effect on the relationship between a firm's internal R&D activities and firm innovation.

Park, Srivastava and Gnyawali (2014) suggested that competitive intensity and Innovation Performance have a curvilinear relationship: as competitive intensity becomes very high or reaches a certain threshold, the benefits will decline.

2.7.2 Organizational Performance

Organizational Performance (OP) has been defined as a set of financial and non-financial information indicators that can assess the degree to which organizational goals and objectives have been met (Kaplan & Norton, 2005). To Singh, Darwish and Potočník (2016), for applied research purposes, Organizational Performance:

May be defined in terms of financial ratios (e.g. return on assets (ROA) and return on equity (ROE)), market outcomes (Tobin's q, market share, stock price and growth), HR-related outcomes (job satisfaction, commitment and others) or organizational outcomes (productivity, service quality, new product development and others). (Singh, Darwish, & Potočník, 2016, p. 214)

Organizational Performance, is one of the central concepts in the field of management, the conceptual domain of is incredibly wide, with a great range of approaches developed by specialist to describe and measure Organizational Performance (Amirkhanyan, Kim, & Lambright, 2014; Andersen, Boesen, & Pedersen, 2016; Quinn & Rohrbaugh, 1981; Rainey, 2014). Singh, Darwish and Potočník (2016, p. 214) say that "Organizational Performance lies at the heart of a firm's survival". Lining up areas such as human resources (HRs) and marketing to operations management, international business, strategy and information systems, the OP is recognized as a central outcome variable of interest (Hult et al., 2008; March & Sutton, 1997; Richard et al., 2009).

Organizational Performance is one of the most important structures discussed in management research and could be considered as the most important criterion for testing the success of SMEs (small to medium-sized enterprises) (Gholami, Asli, Nazari-Shirkouhi, & Noruzy, 2013).

Richard, Devinney, Yip and Johnson (2009), Organizational Performance involves three specific areas of business results: (a) financial performance (profits, return on assets, return on investment, etc.); (b) product market performance (sales, market share etc.); and (c) shareholder return (total shareholder return, value added etc.). Performance is a type of effectiveness indicator, with advantages and disadvantages. For them, we first need to distinguish between

Organizational Performance and the more general construct of organizational effectiveness (Venkatraman & Ramanujam, 1986), where organizational effectiveness represents a broader concept that, in addition to financial performance, also includes wider indicators, including operations effectiveness, customer satisfaction, corporate social responsibility and other outcomes that reach beyond financial quantification (Richard et al., 2009).

Innovation as a key driver of business performance: Schumpeter (1942), and Nelson and Winter (1982), among others, stressed that innovation is the key to economic growth. The fact that there is a direct and positive relationship between innovation and performance has been widely accepted (Damanpour & Evan, 1984; Damanpour, 1991). Several authors also show that innovation is essential for performance improvement and plays an important role in advancing Organizational Performance (Schön & Argyris, 1996; Damanpour, 1991; Fiol & Lyles, 1985; Hurley & Hult, 1998; Senge, 1990; Zaltman, Duncan, & Holbeck, 1973). There is no shortage of literature that emphasizes the importance of the critical role of innovation in driving superior Organizational Performance (Cho & Pucik, 2005).

Carmeli and Tishler (2004) recognize that organizations are complex entities and that it is difficult to measure key resources and their effects on Organizational Performance (Hoskisson, Wan, Yiu, & Hitt, 1999; Robins & Wiersema, 1995), particularly when it is necessary to estimate the effect of a large set of intangible resource and interactions them in a possibly large set of Organizational Performance measures.

Objective measures have been discussed to be more robust than subjective measures, as managers may try to overstate the performance of their organizations and be averse to drawing attention to deficiencies and (Bjorkman & Budhwar, 2007; Dess & Robinson, 1984; Fey, Bjorkman, & Pavlovskaya, 2000; Powell, 1992; Razouk, 2011). Thus, they have been a popular method for evaluating Organizational Performance among scholars, particularly in the field of management, despite this apprehension about subjective measures (Camps & Luna-Arocas, 2012; Achidi Ndofor, & Priem, 2011).

2.7.3 Competitor Performance

Clark and Montgomery (1999) state that the notion of understanding competitors and developing an advantage against them is basic to the strategy; this study aroused interest not only in the marketing literature, but also in economics and management. For Bergen and Peteraf (2002), identifying competitors is a key task for managers who are interesting in exploring their competitive field, thus reinforcing their defenses against possible competitive incursion and

planning competitive attack and response strategies. To them, "competitor identification serves as an important function in several fields" (Bergen & Peteraf, 2002, p. 158). Yu, Wang and Brouthers (2016, p. 21) state that "to create a competitive advantage and generate superior performance, firms must first identify rivals".

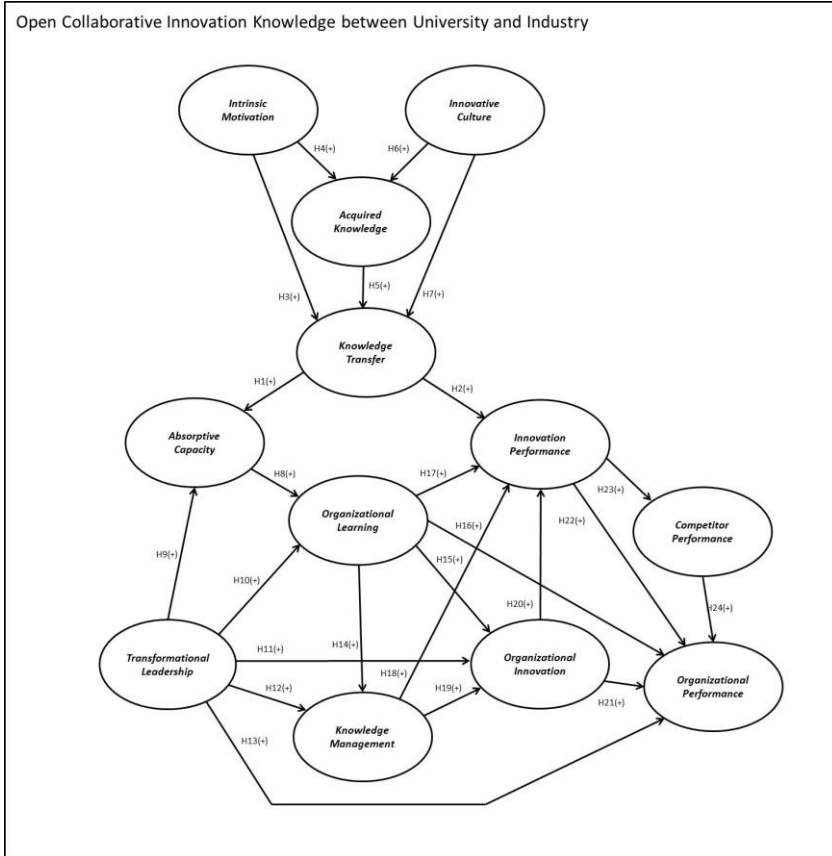
Companies need an effective competitive strategy designed to gain competitive advantage, in order to achieve success and superior market performance (Porter, 1980). To a robust competitive strategy, it is extremely important for managers to be aware of competitors (Bergen & Peteraf, 2002; Chen, Su, & Tsai, 2007; Yu & Cannella, 2007).

Scholars suggest that companies tend to perform better when they are more aware of competitors (Chen et al., 2007). Clark and Montgomery (1996) and Yu, Wang and Brouthers (2015), for example, found that companies perform better by identifying more competitors or over identifying competitors' actions. Furthermore, studies by Clark (2011) and Tsai, Su and Chen (2011) found that the precision of concurrent identification is related to better performance. Hypothesis twenty-four is as follows:

H24. Competitor Performance has a positive impact on Organizational Performance.

Thus, considering the hypothesized relationships, the following integrative theoretical framework is proposed, whose relationships between preceding, mediating and consequent constructs will be tested using the structural equation modeling technique.

Figure 3 - Proposed Integrative Theoretical Framework



Source: Author's creation

Table 4 - Synthesis of Hypothesized Relationships

H1	Knowledge transfer has a positive impact on Absorptive Capacity.
H2	Knowledge transfer has a positive impact on Innovation Performance.
H3	Intrinsic Motivation has a positive impact on Knowledge Transfer.
H4	Intrinsic Motivation has a positive impact on Acquired Knowledge.
H5	Acquired Knowledge has a positive impact on Knowledge Transfer.
H6	Innovative Culture has a positive impact on Acquired Knowledge.
H7	Innovative Culture has a positive impact on Knowledge Transfer.
H8	Absorptive Capacity has a positive impact on Organizational Learning.
H9	Transformational Leadership has a positive impact on Absorptive Capacity.
H10	Transformational Leadership has a positive impact on Organizational Learning.
H11	Transformational Leadership has a positive impact on Organizational Innovation.
H12	Transformational Leadership has a positive impact on Knowledge Management.
H13	Transformational Leadership has a positive impact on Organizational Performance.
H14	Organizational Learning has a positive impact on Knowledge Management.
H15	Organizational Learning has a positive impact on Organizational Innovation.
H16	Organizational Learning has a positive impact on Organizational Performance.
H17	Organizational Learning has a positive impact on Innovation Performance.
H18	Knowledge Management has a positive impact on Innovation Performance.
H19	Knowledge Management has a positive impact on Organizational Innovation.
H20	Organizational Innovation has a positive impact on Innovation Performance.
H21	Organizational Innovation has a positive impact on Organizational Performance.
H22	Innovation Performance has a positive impact on Organizational Performance.
H23	Innovation Performance has a positive impact on Competitor Performance.
H24	Competitor Performance has a positive impact on Organizational Performance.

Source: Author's creation

Table 5 - Measurement summary with all remaining items and sources

Measures and items	Source
<p><u>Knowledge Transfer</u></p> <p>I acquire a lot of knowledge and skills needed for my firm in the process of interacting with universities.</p> <p>I acquire a lot of knowledge and skills applicable for my firm in the process of interacting with universities.</p> <p>I acquire a lot of knowledge and skills that helps me to enhance the firm performance.</p> <p>I have effectively applied my knowledge and skills gained from the process of interacting with the Universities in my job.</p>	<p>Ko, Kirsch & King (2005)</p>
<p><u>Intrinsic Motivation</u></p> <p>I enjoy applying the knowledge and skills learned from the Universities interaction to my job.</p> <p>I am interested in the effective application of knowledge and skills acquired from the Universities interaction to my job.</p> <p>I feel that I am personally benefiting from applying the knowledge and skills acquired from the Universities interaction to my job.</p> <p>I am more comfortable when I can apply the knowledge and skills acquired from the Universities interaction to my job.</p>	<p>Amabile, Hill, Hennessey, & Tighe (1994)</p>
<p><u>Acquired Knowledge</u></p> <p>The interaction with the Universities has developed my problem-solving skills.</p> <p>The interaction with the Universities has sharpened my analytical skills.</p> <p>The interaction with the Universities has helped me develop my ability to work as a team member.</p> <p>The interaction with the Universities has improved my skills in communication.</p> <p>The interaction with the Universities has helped me to develop the ability to plan my own work.</p>	<p>Wilson, Lizzio, & Ramsden (1997)</p>
<p><u>Innovative Culture</u></p> <p>My firm always encourages creativity and innovation.</p> <p>My firm is always receptive to new ways of doing things.</p> <p>My firm always stresses teamwork among all departments.</p> <p>My firm always allows employees to adopt their own approach to the job.</p> <p>My firm always takes a long-term view even at expense of short-term performance.</p> <p>My firm communicates how each employee's work contributes to the firm's big picture.</p> <p>My firm values effectiveness more than adherence to rules and procedures.</p>	<p>O'Cass & Viet Ngo (2007)</p>
<p><u>Absorptive Capacity</u></p> <p>The company has the ability to apply new external knowledge commercially and invent new product.</p> <p>The company I work for has the ability to understand, analyze and interpret information from outside knowledge.</p> <p>The company has the ability to combine existing knowledge with the newly acquired and assimilated knowledge.</p>	<p>Chen, Lin, & Chang (2009)</p>
<p><u>Transformational Leadership</u></p> <p>The firm's management is always on the lookout for new opportunities for the Unit/department/organization.</p> <p>The firm's management has a clear common view of its final aims</p> <p>The firm's management succeeds in motivating the rest of the company.</p> <p>The firm's management always acts as the organization's leading force.</p> <p>The organization has leaders who are capable of motivating and guiding their colleagues on the job.</p>	<p>Podsakoff, MacKenzie, & Bommer (1996)</p>

“continua”

“continuação”

Measures and items	Source
<p><u>Organizational Learning</u></p> <p>The organization has learned or acquired much new and relevant knowledge over the last three years. Organizational members have acquired some critical capacities and skills over the last three years. The organization’s performance has been influenced by new learning it has acquired over the last three years. The organization is a learning organization.</p>	<p>García-Morales, Lloréns-Montes, & Verdú-Jover (2008)</p>
<p><u>Knowledge Management</u></p> <p>The organization has processes for integrating different sources and types of knowledge. The organization has processes for converting competitive intelligence into plans of action. The firm has processes for acquiring knowledge about our business partners. The firm has processes for exchanging knowledge with our business partners.</p>	<p>Gold, Malhotra, & Segars (2001)</p>
<p><u>Organizational Innovation</u></p> <p>The rate of introduction of new products or services into the organization has grown rapidly. The rate of introduction of new methods of production or delivery of services into the organization has grown rapidly. In comparison with its competitors the organization has become much more innovative.</p>	<p>Miller & Friesen (1983)</p>
<p><u>Innovation Performance</u></p> <p>The company can improve its product quality by innovation. The company can accelerate the commercialization pace of the new products by innovation. The company makes considerable profit from its new products. The company can develop new technology to improve operation process. The company purchase new instruments or equipment to accelerate productivity.</p>	<p>Chen, Lin, & Chang (2009)</p>
<p><u>Organizational Performance</u></p> <p>How do you consider your company's performance against profitability growth? How do you consider your company's performance in terms of sales growth? How do you consider your company's performance in terms of improving customer satisfaction? How do you consider your company's performance in terms of overall performance improvement?</p>	<p>Cho, Ozment, & Sink (2008)</p>
<p><u>Competitor Performance</u></p> <p>The growth of market share in relation to the main competitors. Revenue growth in relation to the main competitors. The percentage of sales generated by new products / services relative to the main competitors. Return on sales relative to the main competitors. Return on assets relative to the main competitors. Return on investments relative to the main competitors. Overall performance against major competitors.</p>	<p>Adapted from: Farris, Bendle, Pfeifer, & Reibstein (2006)</p>

Source: Author’s creation

“conclusão”

3. METHODOLOGICAL PROCEDURES

In this step, we present the research method and procedures that were used to achieve an adequate response to the research problem and hypotheses proposed in the integrative theoretical framework.

3.1 RESEARCH CONTEXT AND DATA COLLECTION

We can say that since the industrial revolution the evolution of science and technology has been fundamental to the development of nations. Many countries around the world exert increasing pressure on universities and/or research institutes and organizations on these issues. Consequently, universities and/or institutes of science and technology (ICTs) seek to mobilize and boost scientific research by establishing programs that contribute primarily to the growth of innovation. Given this, the relationship between universities and/or public research institutes and companies has been stimulated in order to leverage the country's economic growth.

Among the developed countries, we can mention Sweden. Gama, Frishammar and Parida (2019, p. 117) says that “in a small economy such as Sweden's, innovation is central to most firms”. Sweden is a leader in innovation and technology, and innovation routines are salient to Swedish firms at all levels of the economy, according to the European Innovation Scoreboard (Global Innovation Index, 2013).

In another context, Guimón (2013, p.1) declare that: “developing countries face even greater barriers to such alliances, calling for a differentiated approach to promoting university–industry collaboration”. In like manner, Schiller and Liefner (2007, p. 548) say that “university–industry cooperation in developing economies cannot be expected to work in the same way as in developed economies”.

The stimulation for absorbing and applying new ideas can be contributed by both partners, too, as universities may be technologically not more advanced or even less advanced than some industry partners. This will be particularly relevant for cooperation with subsidiaries of multinational companies that have access to superior knowledge. (Schiller & Liefner, 2007, p. 548)

Similarly, Guimón (2013, p.8) complemented by saying that “multinational companies (MNCs) have substantially expanded their global innovation networks, and their aim to collaborate with universities located abroad has been identified as one of the main drivers of the internationalization of their R&D centers”. The ABDI and ANPEI (2007) study of 2007

presents that multinational corporations already in Brazil refer to the quality and structure of their interactions with universities as the main reason for their will increase R&D investment in Brazil, even though Brazil is a relatively low factor in terms of science and technology inputs and outputs.

Brazil is among the largest economies in the world, notably a country that has undergone transformations, but has shown signs of change following world trends. Innovation in Brazil has significant challenges, but if we want to keep up with the most developed countries, we will have to chase the loss. An important and fundamental issue for economic growth, but still little explored, is the relationship between University and Industry. Unfortunately, there are some barriers that need to be overcome, Hall, Link, & Scott (2001) claim, for example, that there are intellectual property concerns, inhibiting the industry from forming partnerships with universities.

In developing countries, most R&D activities are carried out by the public sector, through state companies, research institutions and federal universities (Sultz, 2000). His observation is that the problems in terms of cooperation relations between university-industry-government in Latin American countries are: (a) the involvement of firms below expectations, both in quantitative and qualitative terms; (b) absence of 'relevant knowledge' in solving problems when demand exists; (c) little change in the general behavior of firms with regard to relations with universities.

This study focuses on how much external knowledge obtained outside an organization through an open innovation process and its relationship in the University - Industry collaboration flow can positively affect Innovation Performance and Organizational Performance in Brazil.

The study corresponds to a survey that was carried out in Brazil. Specifically, we tested our hypotheses using the structural equation modeling (SEM), on a sample of industry from different manufacturing. The theoretical model was tested in terms of: (1) investigating the effect of Knowledge Transfer on Innovation Performance and Organizational Performance; (2) examining the processes of acquisition, assimilation, transformation and application of knowledge, analyzing the difference and efficiency in the use of the Absorptive Capacity to increase Innovation Performance and Organizational Performance; (3) analyzing determinant relations between Transformational Leadership, Organizational Learning, Knowledge Management, Innovation Performance and Organizational Performance. To validate the model, questionnaires were applied to more than 2,000 innovation experts in the management of university-industry interaction and over 500 responses were received.

3.2 METHOD SELECTION

According to Sekaran (1984), the research methodology should guide the entire research process by means of a set of procedures. With that, methodology is understood as a way of thinking about the social reality and to study it.

Malhotra (2012, p. 60), when referring to the objective of exploratory research, says that this kind of research aims "to explore or do a search on a problem or a situation in order to provide information and greater understanding." In addition, Sampieri, Collado and Lucio (2010, p.93) states that the objective of this type of research is "to review a topic that has been little studied or a research problem, about which there are questions or which has not been previously addressed." Malhotra (2012) and Sampieri et al. (2010) state that this type of research is used to investigate topics or areas through new perspectives, and may assist in creating a theoretical model, as well as preparing and adjusting items that allow its measurement.

Thus, this exploratory phase comprises steps to specify the framework and the research hypotheses, and prepare the constructs and items for measurement.

To be able to define the framework, the research hypotheses and the data collection method, a literature review was conducted, which is pointed out to be a valid method for exploratory research (Malhotra, 2012). Sampieri et al. (2010) comment that literature review helps document the research being carried out, as well as creates added value to existing literature.

The research method proposed here is quantitative and descriptive (Cooper & Schindler, 2016; Hair, Black, Babin, & Anderson, 2010; Malhotra, Birks, & Wills, 2012). A descriptive study is used to test specific hypotheses and analyze relationships between variables (Malhotra, 2012). In this study, the descriptive research used a survey method based on a structured questionnaire given to a population sample with the aim of obtaining respondents' information that is of specific interest to the researcher. The survey to collect data was answered by the respondent him/herself.

The survey questions seek to understand "behaviors, intentions, attitudes, perceptions, motivations, and demographic and life style characteristics" (Malhotra, 2012, p.146). For Hair, Babin, Money and Samouel (2005), surveys are used when data collection involves a large sample of individuals, and it is important that they know clearly that information about their behavior and/or attitudes is being collected.

According to Marconi and Lakatos (2003), and Gil (2008), advantages and limitations may be pointed out on the use of questionnaires applied over the Internet:

- Advantages - reaches a large number of people simultaneously; covers a wide geographical area; saves time and money; no application training is required; ensures respondents' anonymity, resulting in greater freedom and confidence to respond; allows people to respond whenever is more convenient to them; the interviewee is not exposed to any influence by the researcher; answers are more accurate and obtained faster; allows for a more uniform assessment due to the method's impersonal nature; answers that would be materially inaccessible can be collected.
- Limitations - small amount of questionnaires answered; questions without answers; excludes illiterate people; does not allow assistance when the question is not understood; difficulty to understand can lead to an apparent uniformity; not knowing the circumstances in which the survey was answered may have an impact when assessing the quality of answers; when reading all questions before answering them, one question can influence the other; provides critical results in terms of objectivity as items may have different meanings for each subject.

The internet as a tool provides a new technological scenario for the data collection and processing needed to conduct research (Galan & Vernet, 2000; Schonlau, Fricker, & Elliott, 2001). Still according to Malhotra (2012), completing a survey over the Internet is the most suitable method for the collection of data from respondents located in different countries.

Therefore, this study consisted of a survey aimed at obtaining information through an online questionnaire, which was answered via the Internet, directed to professionals working in the innovation department of national and multinational companies in Brazil.

3.3 SAMPLING PLAN

The research populations - the set of elements that have the characteristics matching the study objective (Vergara, 1998) - were executives from innovation departments of national and international companies.

Due to the difficulty in obtaining a probability sample from this population, in view of the data collection method, non-probability sampling has been chosen, that is, sampling of collaborating respondents. The sample will correspond to the number of questionnaires

answered, and it cannot be ensured that the response profile of the executives of the responding companies is similar to that of non-responding industries.

As per Vergara's definition (1998), choosing non-probability sampling is convenient to the researcher and meets some criteria such as accessibility (the individuals are selected due to easy access to them) and typicality (the individuals are considered by the researcher as representative of the target population).

Regarding the sampling method, two main concerns were considered: i) target population and structure and ii) sample size.

For the selection of the companies included in the sample, the thousand largest companies in Brazil were selected according to the magazine "*Valor Econômico*". The questionnaire was addressed to at least three employees per company, working in the areas of R&D, marketing, innovation and IT, especially managers and directors involved in innovation decisions.

Regarding relevance, several strategies were implemented to improve the perceived relevance of these employees to participate in the study; including: message via LinkedIn requesting to join personal network; upon acceptance, a message was sent by email and LinkedIn explaining the importance of participating in the survey, with direct appeals (i.e. direct request and sincere help), as well as an explanation of the reason for the study. Choosing to engage people with innovation knowledge reduced the risk of engaging respondents with insufficient knowledge to answer questions that could lead to lack of data.

The email and research link was signed by the researcher and advisor, containing the logos of the University of São Paulo (USP) and the Faculty of Economics, Administration and Accounting (FEA) and contact numbers for questions.

As an incentive, respondents were informed that they would receive an executive summary and a copy of the study. This strategy of sending a notification first, informing contact numbers, stimulating respondents, identifying the people responsible for the study, using the research institute logo, and the academic nature proved to be effective according to Internet research.

3.4 CREATION OF THE RESEARCH INSTRUMENT

In this research, initially, the technique of data collection used was in-depth interview, because according to Patton one of the intentions of this technique is to "enter into the respondents' perspectives" to find out their feelings, memories and interpretations that cannot

be observed in other ways (Patton, 1990, p. 278). The decision by the semi-structured interview is due to the fact that it allows better discoveries, because the interviewer is free to new questions through unexpected information (Hair Jr. et al., 2005).

A survey was created and applied to a sample of companies / industries classified as innovative, either by belonging to associative entities of this nature, or by information from secondary data or even by the knowledge of the researcher herself. The questionnaire or data collection instrument of this research was structured, formal, containing closed questions, pre-established order and was completed directly by the respondents themselves. The questionnaire was created based on the literature review, which allowed the structuring and operationalization of the theoretical framework with the research hypotheses.

According to Hayes (2008), to ensure the correct creation of a questionnaire, the statements (that which has an affirmation character; a proposition enunciated as true) must have some special characteristics, including: statements should not contain irrelevant items; items must be consistent and not have excessive words; and statements should not be ambiguous, but convey only one idea.

The choice of the method was made according to the objectives of the empirical research. Because the questionnaire was applied directly to employees of companies/industries, it was characterized as a primary source of information (Malhotra, 2012). The fact that the questionnaire was closed, gave a greater degree of control over the collection and its standardization, ensures that all participants answer the same questions, so that they are comparable (Churchill & Iacobucci, 2006).

There was no need for the respondents to identify themselves, Marconi and Lakatos (2003) affirm that the advantage of this type of instrument is to allow greater freedom in the answers, due to anonymity. But there are also its disadvantages, they are: the inability to help the respondent if there are questions - so it was made available to the respondent how to contact the researcher; one question can influence the others in reading all questions - for that, the data collection software randomized the order of the 55 items that comprised the constructs; control and verification become more difficult because they are unaware of the circumstances in which the questionnaire was completed - this was partially assessed by the time the respondent took to answer the questionnaire (Marconi & Lakatos, 2003).

The questionnaire was divided into three parts: the first was questions related to the constructs used in modeling; the second was questions about the company; the third was information from the respondent.

The scale used for the constructs was the interval type (assumed as), where respondents were asked to choose numbers from 1 to 7. The analysis rests on the proposition that if an individual has a favorable attitude towards the object, he should basically agree with the favorable sentences and disagrees with the unfavorable, and so vice versa. For Churchill and Iacobucci (2006), the responses indicate an increasing degree of intensity, and depending on the intervalency of the responses, if warranted, the data may be treated as quantitative and from an interval scale. Similarly, Marconi and Lakatos (2003), admit that the answers give a judgment by means of a scale with various degrees of intensity for the same item. A detailed analysis of this assumed interval scale condition can be seen in Mazzon (1981).

Thus, the respondent who selects number 1 would be signaling total disagreement of the statement, while another indicating number 7 would indicate full agreement. Note 4 denote median position (or indifferent opinion), and notes 2 and 3, much and little disagreement, and note 5 and 6 little or much agreement.

The questions 1 to 44 of the questionnaire were analyzed at levels of disagreement and agreement. The degree of disagreement or agreement was stipulated by a 7 point scale, which corresponded to the opinions expressed by the respondents. Where 1 = totally disagree and 7 = totally agree.

The questions 45 to 48 of the questionnaire were analyzed at levels of terrible and great. The degree of terrible or great was stipulated by a 7 point scale, which corresponded to the opinions expressed by the respondents. Where 1 = terrible and 7 = great.

The questions 49 to 55 of the questionnaire were analyzed at levels of much worse and much better. The degree of much worse or much better was stipulated by a 7 point scale, which corresponded to the opinions expressed by the respondents. Where 1 = much worse and 7 = much better.

In order to validate the research content, the research was sent to three professors specializing in the theme, to evaluate the proposed scales (modification, addition or deletion of items). Subsequently, to verify the coherence of the questionnaire and possible biases, the research was pre-tested. The pretest "should be conducted in an environment and context similar to that of the actual survey.... should be continued until no further changes are needed" (Malhotra, 2006, p.92).

The purpose of the pretest is to control the effectiveness of measurement (Schrader, 1978).

3.5 DATA COLLECTION TECHNIQUE

Data collection "is the research stage in which the application of the elaborated instruments and the previously selected techniques begins, aiming the collection of data according to the predicted" (Lakatos & Marconi, 2010, p.149).

The data was collected online, through the Survey Monkey software, which allows surveys to be easily completed, and contains analysis tools and a display of results, making results available in real time.

Database formation began on May 22, 2019 and ended on November 5 of the same year. Totalling 2688 LinkedIn connections requested for database formation. Survey submission began on June 27, 2019 and ends on December 12, 2019, totaling 2.268 surveys submitted and 504 responses. If we assumed that survey respondents had, on average, the same position as non-respondents, the estimated sample error of the proportion for the maximum variance of the constructs' items ($p = 1-p = .50$) would be:

$$e = z_{\alpha/2} ((p(1-p)/n))^{1/2} ((N-n)(N-1))^{1/2}$$

Where:

e = maximum sampling error

p = proportion of agreement that maximizes variance ($p=1-p=0,50$)

N = potential population size of respondents to the survey questionnaire ($N=2268$)

n = sample size of respondents (number of executives who answered the questionnaire: $n=504$ and minimum of valid responses for the statements' scale $n_1=415$)

$$e_{n=504} = 1,8 \quad \text{and} \quad e_{n=415} = 2,1$$

The completed questionnaires were subjected to a process of verification and data analysis, which identified response time, missing values, outliers, systematic sequencing composed of answers marked on the scales used, among others.

After the necessary treatment, a master file was created containing the data, processed through specific software of applied scientific research.

3.6 DATA PROCESSING AND RESULTS ANALYSIS

The analysis of the collected quantitative data was conducted in three phases: (1) univariate analysis, (2) bivariate analysis, and (3) multivariate analysis. Each phase was used specific techniques, which are detailed below.

The analysis and process of the collected data was conducted with aid of the statistical software SPSS and Smart PLS.

The univariate analysis of the collected data involves a review of data distribution, taking into account only one variable or characteristic (Schrader, 1978). At first, a critical data analysis was performed, accounting for inconsistency of intra-respondent answers and missing data. From there, the descriptive statistics related to frequency distribution can be calculated: measure of central tendency (average) and measure of dispersion (standard deviation).

The bivariate analysis involves the analysis of two variables, and an association measure between them may be determined. Typical examples of bivariate analysis include the two variable test of independency (chi-square test) and the study of the linear relationship between two variables, either through Pearson's or Spearman's linear correlation coefficients (Reis, Melo, Andrade, & Calapez, 1997).

The multivariate analysis considers 3 or more variables simultaneously. According to Malhotra (2012, p. 373), "it differs from the univariate technique because it changes from focusing on the degree (middle point) and distribution (variance) of elements to the degree of relationship (correlations or covariance) between them." These techniques were used to assess the proposed scales, confirmatory and structural model, taking into account that the latter is a set of dependent relationships between constructs that can be tested empirically. That is, it is about a representation and operationalization of the theory (Hair et al., 2006).

In this phase, the techniques used were: (1) confirmatory factor analysis, and (2) test of the structural model through the Structural Equation Modeling (SEM).

Structural equation modeling (SEM) is a set of models that fit construct networks to observed data, that is, it allows researchers to incorporate unobservable variables to measure direct, indirect effects and errors (Hair, Hult, Ringle, & Sarstedt, 2016).

There are two types of SEM: covariance-based SEM (CB-SEM) and partial least squares SEM (PLS-SEM) (Benitez, Henseler, Castillo, & Schuberth, 2019; Hair et al., 2016; Roth, Himbert, & Zielke, 2017). PLS-SEM is also called partial least squares path modeling (Hair et al., 2016). In this research we use Smart-PLS software.

4. DATA ANALYSIS

This chapter is divided into two parts. In first part of the results analysis we will verify what the descriptive results of the sample reveal. In the second part of the research, we will discuss the results observed in the indicators that are part of the measurement models of the constructs proposed in this dissertation and the confirmatory analysis of theoretical framework.

4.1 FIST PART OF DATA ANALYSIS

Knowledge has been playing an important role in the economy and in the entire production process, thus leading universities to play a new role in society. The contribution of science in this process varies according to the areas of knowledge. The sectors linked to the industries are those of chemistry, near-chemistry, pharmaceutical, semiconductors, computers, electronic instruments, electrical and aerospace equipment (Cohen, Nelson, & Walsh, 2002); Schartinger, Rammer, & Fröhlich, 2006). In this study, the survey was sent to all industry sectors listed among the thousand largest in Brazil.

According to Rapini (2007), the intensity of this relationship between university and company ends up being constrained by other factors, such as those related to the industrial sector (size of the firm and characteristics of the development of new products), to the public research sector, to technology, to firm and geographic factor. For her, the areas of knowledge with the greatest relationships with universities in Brazil are Engineering and Computer Science and Agrarian Sciences.

In the research carried out by Segatto-Mendes and Sbragia (2002), with the objective of verifying how university-company cooperation occurs in Brazilian universities, it was found that for companies, the motivators of this relationship were: access to highly qualified human resources at the university, reduction of costs and/or risks involved in research and development projects, access to the most new knowledge developed in academia, identification of students from the educational institution for future recruitment and resolution of technical problems that generated the need for cooperative research. Regarding the main barriers raised by the research were: university bureaucracy, very long project duration and differences in level of knowledge between people in the university and company involved in the cooperation. The factor government fund for research support was appointed as a facilitator of the process.

In this first part of the results analysis we will verify what the descriptive results of the sample reveal. Initially, the sample is characterized by information about the respondent: age,

gender, education level, hierarchical position in relation to the CEO of the company and name of work area/department. In sequence, the sample is characterized by general company information.

4.1.1 Sample Characterization

Age Distribution

Participants' ages was defined in 5 categories. The age between 30 and 39 years old had the highest percentage (43.8%) of the respondents in this survey, with 26.5% being in the range of 40 to 49 years old and 13.9 % between 50 and 59 years old.

Table 6 - Sample profile by age range

Items	Frequency (%) n = 404
Under 30 years	13.1
30 to 39 years old	43.8
40 to 49 years old	26.5
50 to 59 years old	13.9
60 years or older	2.7

Source: Field Survey Data

Gender Distribution

Table 7 shows that there was a predominance of male respondents in the sample (77.5%). Therefore, it was observed that the sample isn't balanced between genders, with only 22.5% identified as female.

Table 7 - Sample profile by gender

Items	Frequency (%) n = 404
Feminine	22.5
Masculine	77.5

Source: Field Survey Data

Distribution by educational level

There was a high concentration of respondents with lato sensu postgraduate 58.2%, followed by respondents with stricto sensu postgraduate 27.2%. Of the 404 respondents, 45.3% studied engineering, 24.3% studied administration and 17.3% studied computer science or information technology. It should be noted that a significant portion of respondents came from courses in the engineering area, with an expressive proportion who took a lato sensu MBA.

Table 8 - Sample profile by educational level

Items	Frequency (%) n = 404
High school	.2
Undergraduate	14.4
Lato Sensu Postgraduate/Specialization (MBA)	58.2
Stricto Sensu Postgraduate (Master and Doctorate)	27.2

Source: Field Survey Data

Distribution by hierarchical position

The hierarchical position of the respondents in relation to the company's CEO was 30.4% at the 4rd level below (thus denoting an eminently technical occupation) and 17.8% just one level below (occupying director position). At the management level, we have about 53% of respondents, mainly in positions in the areas of Innovation (15.1%), Research and Product Development (12.7%) and IT (7.6%).

Table 9 - Hierarchical position in relation to the CEO of the company

Items	Frequency (%) n = 404
1st hierarchical level below	17.8
2nd hierarchical level below	24.0
3rd hierarchical level below	27.7
4th hierarchical level or below	30.4

Source: Field Survey Data

4.1.2 Company Information

The survey raised information about the organization in which respondents work, whether in a public or private organization; open and closed capital; annual gross revenue and the portion corresponds to exports (if any), as well as the perception about the level of competitiveness of the company/division, the level of innovation and types of collaborative processes existing with external entities.

Type of company and type of capital

The table below contains two sections: type of company and type of capital. The first part shows that 96.1% of the surveyed companies are private. The second part displaying similar values, been 51.2% open and 48.8% closed capital.

Table 10 - Type of company and type of capital

Items	n	Frequency (%)	
		Public	Private
Is the company you work for public or private?	406	3.9	96.1
		Open	Closed
What type of capital: open or closed?	406	51.2	48.8

Source: Field Survey Data

Gross annual revenue

Table 11 provides a statement of the gross annual revenue of the respondents companies. Where 36.1% have revenues ranging from 1 to 999 million reais and 38.5 % have revenues ranging from 1 to 10 billion reais.

Table 11 - Gross annual revenue

Items	Frequency (%) n = 327
1 to 999 million	36.1
1 to 10 billion	38.5
More 10 billion	25.4

Source: Field Survey Data

Percentage (%) average that the company exports

We verify at the table below the percentage average that the company exports, being able to observe that 69.8% of companies exporting between 0 to 20 % of their production. From 21% onwards of exported production, the values are decreasing, that is, less than 12.3% of companies export.

Table 12 - Percentage (%) average that the company exports

Items	Frequency (%) n = 406
0 a 20%	69.8
21 a 40%	12.3
41 a 60%	6.9
61 a 80%	6.6
81 a 100%	4.5

Source: Field Survey Data

How competitive is the company from the respondents' point of view

In this next table, we conclude that 51.2% of the people respondents consider the company they work for as very competitive and only 6.9% consider the company they work for as nothing or little competitive. It is plausible to admit that these results contain a bias in the perception of a positive response, even due to the fact that most respondents occupy a technical position at the 3rd or 4th level below the company's CEO.

Table 13 - How competitive is the company from the respondents' point of view

Items	Frequency (%) n = 406
Nothing competitive	.7
Little competitive	6.2
Average competitive	27.6
Very competitive	51.2
Extremely competitive	14.3

Source: Field Survey Data

How innovative is the company from the respondents' point of view

Regarding innovation, 36.4% of the respondents consider that the company is innovative average and with approximate value, 43.4% consider that the company is very or extremely innovative. It should be noted that 20.2% perceive their company as nothing or little innovative, but still competitive in the market, since only 6.9% perceive it as nothing or little competitive, as seen in the previous table.

Table 14 - How innovative is the company from the respondents' point of view

Items	Frequency (%) n = 406
Nothing innovative	3.0
Little innovative	17.2
Average Innovative	36.4
Very innovative	33.5
Extremely innovative	9.9

Source: Field Survey Data

Does the company maintains collaborative process ... with Universities, ICTs, TICs, TTOs, Funding Agency and Others

This last table shows us the reality of Brazil in the relation University, Institutes and others with the companies. We realize that the University / Company relationship is bigger, but still it reaches a little over 50% (51.2%). ICTs come in second with 33.5% and Funding Agency in third with 10.5% of the collaborative representation. Within the 26.4% value of "Others":

87.3% does not maintain any collaborative process; 3.8% have startup relationships; 2% have relationships with some innovation center or SENAI (National Industrial Learning Service). On average, companies maintain 1.3 types of collaborative forms of relationship with external entities in the innovation area.

Table 15 - Does the company maintains collaborative process ... with Universities, ICTs, TICs, TTOs, Funding Agency and Others

Items	Frequency (%) n = 504
University	51.2
ICTs - Science and Technology Institutions	33.5
TICs - Information and Communication Technology	.0
TTOs - Technology Transfer Offices	6.9
Funding Agency	10.5
Others	26.4

Source: Field Survey Data

4.2 SECOND PART OF DATA ANALYSIS

In the second part of the research, we investigate the roles that different open innovation partners (Knowledge Transfer; Intrinsic Motivation; Acquired Knowledge; Innovative Culture; Absorptive Capacity; Transformational Leadership; Organizational Learning; Knowledge Management) have played in improving Organizational Innovation, Innovation Performance, Organizational Performance and Competitor Performance. The questionnaire in this part consists of questions that aim to identify the attitudes of respondents to the constructs proposed above.

In this next section we will discuss the results observed in the indicators that are part of the measurement models of the constructs proposed in this dissertation. For analysis of the indicators of each construct, we present the mean and standard deviation. These procedures are intended to evaluate assumptions of normality in variations.

The Tables 16-25 shows the results obtained in the analysis variables of the constructs research-related, remembering that, in these cases, the scale measured the degree of the question of the type of agreement/disagreement matrix, varying from 1 (strongly disagree) to 7 (strongly agree).

The Table 26 show the results obtained in the analysis variables of the constructs research-related, remembering that, in these cases, the scale measured the degree of the question of the type of terrible/great matrix, varying from 1 (terrible) to 7 (great).

The Table 27 show the results obtained in the analysis variables of the constructs research-related, remembering that, in these cases, the scale measured the degree of the question of the type of worse / better matrix, varying from 1 (much worse) to 7 (much better).

Evaluation of construct indicators

The Tables 16 shows the results obtained in the analysis of four variables of the Knowledge Transfer construct. We can observe that all variables presented the mean higher than the midpoint of the scale from 1 to 7 (point 4). In the variables KT3 ($\bar{x} = 4.69$) and KT1 ($\bar{x} = 4.74$), the coefficients of variation are higher (0.35 and 0.38, respectively). This shows that the respondents' opinions are less concentrated around the average, that is, they are spread over a larger range. We also observed that the standard deviations of these first two variables are relatively low, indicating this concentration of responses close to the average of these variables, which is also evidenced by the coefficients of variation, respectively 0.25 and 0.29. In the first variable, 81.6% of the answers are in points of agreement, mainly in the points of scale 6 and 7. In the second variable, we find that 72.5% of the respondents are in the points of agreement of the scale. In the variables KT3 ($\bar{x} = 4.69$) and KT1 ($\bar{x} = 4.74$), the coefficients of variation are higher (0.35 and 0.38, respectively). This shows that the respondents' opinions are less concentrated around the average, in other words, the responses are spread over a range wider. The differential from the variable KT2 to KT1 ($\bar{x} = 4.74$) was just the word "applicable", thus demonstrating to the respondent are more favorable attitude towards "acquiring a knowledge or skills applicable for the company in the interaction process with universities" than "acquiring a knowledge or skills needed knowledge or skill for the company in the interaction process with universities".

In the variable KT4, the mean was higher than the variable KT3, demonstrating that, for the respondent, it is more relevant for him "to apply the knowledge and other skills acquired in the process of interaction with universities at work" than in "acquiring knowledge and other skills that help you improve his company's performance. The means of the four variables that make up this construct are above the midpoint of the scale, revealing that the respondents strongly agree with these statements. As will be seen later, it is necessary to test whether these

variables have internal consistency (Cronbach's alpha), that is, whether they actually form a latent construct (in this case, $\alpha = .798$, showing that the construct can be accepted as reliable).

Table 16 - Descriptive statistics of the Knowledge Transfer construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
KT2	I acquire a lot of knowledge and skills applicable for my firm in the process of interacting with universities.	6	1.7	2.6	3.0	11.1	18.2	26.5	36.9	5.68	1.422
KT4	I have effectively applied my knowledge and skills gained from the process of interacting with the Universities in my job.	461	2.4	4.6	6.5	13.7	23.6	24.7	24.5	5.24	1.538
KT1	I acquire a lot of knowledge and skills needed for my firm in the process of interacting with universities.	461	4.6	7.8	9.8	19.3	21.0	20.2	17.4	4.74	1.689
KT3	I acquire a lot of knowledge and skills that helps me to enhance the firm performance.	461	6.7	7.8	11.1	15.4	20.2	21.3	17.6	4.69	1.788

Source: Field Survey Data

Tables 17 shows the results obtained in the analysis of four variables of the Intrinsic Motivation construct. We can observe that all the variables presented have the mean higher than the midpoint of the employed scale. We also observed that the standard deviations the first two variables are smaller than the last two, and with lower variation coefficients – greater homogeneity of opinions).

It is identified that the highest concordance by the respondents was “strongly agree” with the variable IM3 ($\bar{x} = 5.43$) and IM1 ($\bar{x} = 5.26$). The two variables refer to feelings that bring personal benefit; it is personified, where the respondents’ feels benefited and joyful to apply the knowledge and skills learned from the Universities interaction to their jobs. Regarding the variables IM2 ($\bar{x} = 4.96$) and IM4 ($\bar{x} = 4.48$), with high levels of agreement but lower than those of the first two variables, the questions are related to the "application" of knowledge and the skills acquired by the interaction of Universities in the work, that is no longer a benefit of personal pleasure, but related with work. Similar to the results of the previous table, there is a high internal consistency (reliability) of the Intrinsic Motivation construct ($\alpha = .801$), as will be seen later.

Table 17 - Descriptive statistics of the Intrinsic Motivation construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
IM3	I feel that I am personally benefitting from applying the knowledge and skills acquired from the Universities interaction to my job.	461	.9	4.6	4.6	14.1	19.5	27.5	28.9	5.45	1.451
IM1	I enjoy applying the knowledge and skills learned from the Universities interaction to my job.	461	1.1	5.0	7.6	14.1	23.0	23.4	25.8	5.26	1.506
IM2	I am interested in the effective application of knowledge and skills acquired from the Universities interaction to my job.	461	3.0	5.9	8.9	15.8	25.4	22.6	18.4	4.96	1.579
IM4	I am more comfortable when I can apply the knowledge and skills acquired from the Universities interaction to my job.	461	5.6	6.9	14.1	19.7	25.4	17.4	10.8	4.48	1.621

Source: Field Survey Data

Tables 18 shows the results obtained in the analysis of five variables of the Acquired Knowledge construct. We can observe that all the variables presented have the mean higher than the midpoint of the scale. It is identified that the highest concordance by the respondents was with the variable AK2 ($\bar{x} = 6.51$), followed by the variable AK4 ($\bar{x} = 5.72$). Once again the two variables refer to feelings that bring personal benefits, in the first one (AK2) being interaction with universities brings analytical skills and in the second one (AK4) brings communication skills. Regarding the variables AK5 ($\bar{x} = 4.81$) and AK3 ($\bar{x} = 4.69$), the questions are related to work, something impersonal, the first (AK5) the interaction with the Universities helps develop the ability to plan the work and the second (AK3) to work as a team member.

Table 18 - Descriptive statistics of the Acquired Knowledge construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
AK2	The interaction with the Universities has sharpened my analytical skills.	461	.2	.2	.7	1.5	9.3	21.3	66.8	6.51	.846
AK4	The interaction with the Universities has improved my skills in communication.	461	1.7	1.5	3.0	9.1	19.7	31.0	33.8	5.72	1.333
AK5	The interaction with the Universities has helped me to develop the ability to plan my own work.	461	5.2	8.7	8.9	15.4	21.9	19.1	20.8	4.81	1.766
AK3	The interaction with the Universities has helped me develop my ability to work as a team member.	461	6.1	7.4	9.8	18.2	23.4	17.6	17.6	4.69	1.730
AK1	The interaction with the Universities has developed my problem-solving skills.	461	9.1	9.8	15.8	22.6	19.1	16.3	7.4	4.11	1.694

Source: Field Survey Data

Tables 19 shows the results obtained in the analysis of seven variables of the Innovative Culture construct. We can observe that all the variables presented have the mean higher than the midpoint of the scale from 1 to 7 (point 4). The variation coefficients range from 0.20 (IC7) to 0.34 (IC5), decreasing the homogeneity of opinion as the variables are placed in the table. It is identified that the highest concordance by the respondents was with the variable IC7 ($\bar{x} = 6.11$). Also, it is noticed that the variable IC7 ($\bar{x} = 6.11$), IC4 ($\bar{x} = 5.21$), IC2 ($\bar{x} = 5.20$), IC3 ($\bar{x} = 5.19$) and IC1 ($\bar{x} = 5.03$) the mean values are relatively high, denoting high percentages of agreement by the respondents in relation to these statements. The questions corresponding to these variables involve aspects related to the respondents' productivity at work: effectiveness, own approach to work, new ways of doing things, teamwork, encourages creativity and innovation. Now, as variables IC6 ($\bar{x} = 4.74$) and IC5 ($\bar{x} = 4.68$), there are questions related to the respondent's performance at work. We can conclude, therefore, that the employees have a lower degree of agreement in terms of the perception of feedback from the companies that they work for.

Table 19 - Descriptive statistics of the Innovative Culture construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DTI	2	3	4	5	6	7=CT		
IC7	My firm values effectiveness more than adherence to rules and procedures.	461	1.1	.9	2.4	6.3	11.5	26.7	51.2	6.11	1.222
IC4	My firm always allows employees to adopt their own approach to the job.	461	1.7	2.6	4.6	15.8	31.9	25.6	17.8	5.21	1.333
IC2	My firm is always receptive to new ways of doing things.	461	1.3	3.0	8.5	11.9	31.0	25.6	18.7	5.20	1.381
IC3	My firm always stresses teamwork among all departments.	461	3.3	3.7	7.4	16.1	20.4	24.3	24.9	5.19	1.587
IC1	My firm always encourages creativity and innovation.	461	2.4	5.4	8.7	15.8	26.0	21.5	20.2	5.03	1.550
IC6	My firm communicates how each employee's work contributes to the firm's big picture.	461	4.1	5.9	10.6	17.8	27.3	21.7	12.6	4.74	1.564
IC5	My firm always takes a long-term view even at expense of short-term performance.	461	4.1	7.2	11.9	16.7	26.7	20.2	13.2	4.68	1.607

Source: Field Survey Data

Tables 20 shows the results obtained in the analysis of three variables of the Absorptive Capacity construct. The highest degree of agreement was with the variable AC1 ($\bar{x} = 5.71$). This question is related to the ability of commercial "application" of the new external knowledge and "invention" of new products by the company. However, we observed that in the other two

variables with lower averages (AC2 = 4.85 and AC3 = 4.40), the questions are related to the company's "ability" to understand, analyze, interpret external knowledge or combine existing knowledge with newly acquired and assimilated ones. Given the greater variability of opinion among the respondents, then, we can conclude that the interviewees of the companies are less able to the ability to "deal" with external knowledge as they have with commercial "application" of the new external knowledge and "invention" of new products by the company.

Table 20 - Descriptive statistics of the Absorptive Capacity construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1-DTI	2	3	4	5	6	7-CT		
AC1	The company has the ability to apply new external knowledge commercially and invent new product.	425	.4	.9	3.3	6.5	27.8	31.5	29.7	5.71	1.149
AC2	The company I work for has the ability to understand, analyze and interpret information from outside knowledge.	425	4.1	6.7	11.7	16.1	20.4	20.4	20.6	4.85	1.701
AC3	The company has the ability to combine existing knowledge with the newly acquired and assimilated knowledge.	425	7.5	11.8	10.0	19.4	19.9	16.0	15.4	4.44	1.812

Source: Field Survey Data

Regarding the construct Transformational Leadership we can see that all the variables have the average closest the midpoint of the scale.

The results also show a marked degree of agreement, especially in the first three statements (TL1, TL4 and TL2), with averages around the fifth point of the scale. The two statements with the least agreement are TL5 and TL3, with averages close to the midpoint of the evaluation scale, but with the highest coefficients of variation. It should be noted, however, that the internal consistency was very significant ($\alpha = .814$). Also, it is noticed that in those first three questions, they are related to the "skilled" of the company's management, they are: always "attentive to new opportunities", "act as the main force" and "have a clear common vision of the objectives". However, the last two questions show us that in terms of management "motivation" and "orientation", the average values are the lowest. It is plausible to deduce from these results that a significant portion of the respondents' companies seem to have a management problem in terms of "motivation" and "orientation" towards to employees.

Table 21 - Descriptive statistics of the Transformational Leadership construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
TL1	The firm's management is always on the lookout for new opportunities for the Unit/department/organization.	468	2.1	6.6	7.3	16.5	25.2	20.5	21.8	5.05	1.573
TL4	The firm's management always acts as the organization's leading force.	468	3.0	3.6	7.9	18.8	28.6	20.3	17.7	4.98	1.492
TL2	The firm's management has a clear common view of its final aims	468	2.4	4.1	9.8	16.2	28.4	23.7	15.4	4.97	1.467
TL5	The organization has leaders who are capable of motivating and guiding their colleagues on the job.	468	2.8	10.0	11.5	19.0	23.1	19.4	14.1	4.64	1.624
TL3	The firm's management succeeds in motivating the rest of the company.	468	5.6	9.2	12.0	22.2	25.9	16.7	8.5	4.38	1.595

Source: Field Survey Data

Tables 22 shows the descriptive statistics for the four items that make up of the Organizational Learning construct. The first two variables have an average of around five and have a lower coefficient of variability. For the next two items, we noticed an average closer to the median point of the scale and with a higher coefficient of variation. That is, for the first two items there is greater homogeneity of opinion, while for the others there is greater heterogeneity. Notwithstanding this scale has been validated in previous studies (Podsakoff, MacKenzie, & Bommer, 1996), this differentiated behavior showed a relatively low internal consistency of the construct ($\alpha = .510$), as will be seen in a subsequent topic. In interpretative terms, we can see that the first two questions are related to "learning process", the organization is a "learning organization" and the "members have acquired some critical capacities and skills over the last three years". However, the last two questions show us that the average values are lower. We can conclude that a significant number of respondents do not strongly agree that in the past three years the organization has learned or acquired much new and relevant knowledge or the organization's performance has been influenced by new learning it has acquired.

Table 22 - Descriptive statistics of the Organizational Learning construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
OL4	The organization is a learning organization.	468	1.9	3.4	5.3	17.5	19.9	22.0	29.9	5.36	1.516
OL2	Organizational members have acquired some critical capacities and skills over the last three years.	468	2.4	3.6	6.8	17.9	23.5	26.7	19.0	5.13	1.474
OL1	The organization has learned or acquired much new and relevant knowledge over the last three years.	468	5.6	6.2	12.0	17.9	20.5	21.6	16.2	4.71	1.701
OL3	The organization's performance has been influenced by new learning it has acquired over the last three years.	468	6.4	7.1	9.4	19.0	26.1	17.9	14.1	4.62	1.682

Source: Field Survey Data

Similar results to the Organizational Learning construct can be observed in relation to the Knowledge Management construct. The first two items with higher averages and lower coefficients of variation and the opposite with the last two variables. Although this scale also has been validated in previous studies (García-Morales, Lloréns-Montes, & Verdú-Jover, 2008), even excluding the KM1 variable from the scale, the internal consistency indicator still fell short of what was desired ($\alpha = .584$). Looking at the first two questions, in the first, the majority of the respondents strongly agree that the firm has processes for “exchanging” knowledge with their business partners, but in the second item, the most of them do agree little or disagree that the firm has processes to “acquiring” knowledge about its business partners. We can conclude that the significant portion of respondents shows low agreement that the organization has processes for “integrate” different sources and types of knowledge. There is also low agreement that the organization has processes to “converting competitive intelligence into plans of action”.

Table 23 - Descriptive statistics of the Knowledge Management construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
KM4	The firm has processes for exchanging knowledge with our business partners.	468	1.5	3.4	7.7	16.2	25.4	26.7	19.0	5.17	1.422
KM3	The firm has processes for acquiring knowledge about our business partners.	468	2.1	4.3	8.1	19.7	31.0	21.2	13.7	4.91	1.415
KM1	The organization has processes for integrating different sources and types of knowledge.	468	8.1	12.8	8.8	15.0	24.1	14.3	16.9	4.45	1.863
KM2	The organization has processes for converting competitive intelligence into plans of action.	468	6.6	8.5	10.0	27.4	26.1	15.4	6.0	4.28	1.543

Source: Field Survey Data

Tables 24 shows the results obtained in the analysis of three variables of the Organizational Innovation construct. We can observe that all the variables presented have the mean higher than the midpoint of the scale. Looking at the first two questions, the majority of respondents strongly agree that the rate of introducing "new methods of production or service delivery" and "new products or services" into the organization has grown rapidly. Aspects related to new products/ production and services. The third issue is related to the comparison of organizational innovation with its competitors. We can conclude that the respondents do not strongly agree that the organization has become much more innovative compared to its competitors. Analyzing the coefficients of variability, we can see that they are very different, ranging from 0.21 to 0.41, respectively, for OI2 and OI3. In the same way that we verified for the Knowledge Management construct, even with the removal of the variable OI3, the internal consistency ($\alpha = .429$) also fell below the desired minimum level, as will be seen below.

Table 24 - Descriptive statistics of the Organizational Innovation construct

Variable	Items	n	Frequency (%)						7=C T	Mean	Standard Deviation
			1=DT1	2	3	4	5	6			
OI2	The rate of introduction of new methods of production or delivery of services into the organization has grown rapidly.	468	1.3	.9	3.2	6.8	17.3	30.3	40.2	5.90	1.260
OI1	The rate of introduction of new products or services into the organization has grown rapidly.	468	5.1	7.5	14.1	18.6	24.6	18.8	11.3	4.52	1.630
OI3	In comparison with its competitors the organization has become much more innovative.	468	8.1	11.5	9.8	19.9	22.4	16.0	12.2	4.34	1.773

Source: Field Survey Data

In terms of the five items that make up the Innovation Performance construct, it is identified that the highest concordance by the respondents was with the variable IP3, with low variability of opinion. The majority of the respondents strongly agree that the company "makes considerable profit from its new products". But on the other four questions, expressive proportion of respondents do not strongly agree that the company can do "things" (accelerate, purchase, improve and develop) that result in innovation, accelerate productivity and improve the operation process. We can conclude that the respondents strongly agree that the company can do makes considerable profit but they do not strongly agree in the "improvement" of the company.

Table 25 - Descriptive statistics of the Innovation Performance construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
IP3	The company makes considerable profit from its new products.	468	1.7	4.1	7.3	12.4	21.8	28.6	24.1	5.31	1.488
IP2	The company can accelerate the commercialization pace of the new products by innovation.	468	4.1	7.7	7.1	19.9	27.4	20.3	13.7	4.74	1.585
IP5	The company purchase new instruments or equipment to accelerate productivity.	468	4.1	7.9	12.4	18.4	22.2	20.3	14.7	4.67	1.652
IP1	The company can improve its product quality by innovation.	468	6.6	8.5	14.1	20.1	18.4	16.5	15.8	4.48	1.767
IP4	The company can develop new technology to improve operation process.	468	8.1	10.9	17.3	19.2	21.6	15.0	7.9	4.12	1.690

Source: Field Survey Data

Tables 26 shows the results obtained in the analysis of four variables of the Organizational Performance construct. Recalling that these questionnaires were analyzed in scales between “terrible” and “great” points. We can observe that all the variables presented have the mean higher than the midpoint of the scale. It is identified that the highest concordance by the respondents was “good” with the variable IP3 ($\bar{x}= 5.04$). Also, it is noticed that the highest concordance by the respondents was expressed by “good” or “very good” to all variables of the OP. We can conclude that the respondents do not consider company's performance "great" in terms of "improving customer satisfaction", "overall performance improvement", " sales growth" and "against profitability growth".

Table 26 - Descriptive statistics of the Organizational Performance construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
OP3	How do you consider your company's performance in terms of improving customer satisfaction?	420	1.7	2.9	7.1	17.1	31.9	28.1	11.2	5.04	1.308
OP4	How do you consider your company's performance in terms of overall performance improvement?	420	.7	1.9	10.0	19.3	34.0	26.0	8.1	4.94	1.209
OP1	How do you consider your company's performance against profitability growth?	420	2.6	3.8	8.1	20.7	27.4	25.5	11.9	4.90	1.421
OP2	How do you consider your company's performance in terms of sales growth?	420	3.6	3.6	10.0	18.6	29.5	24.0	10.7	4.82	1.456

Source: Field Survey Data

Tables 27 shows the results obtained in the analysis of seven variables of the Competitors Performance construct. Recalling that these questionnaires were analyzed in scales between "much worse" and "much better" points. See that of all variables the midpoint of the scale. We can see that the mean of all variables was close to the midpoint of the scale. We also observed that the standard deviation is relatively low, with low coefficients of variation and very similar to each other. It is identified that the highest concordance by the respondents was "somewhat better" with the variable CP7 (\bar{x} = 4.84). Also, it is noticed the highest concordance by the respondents was expressed by "not sure" (4) or "somewhat better" (5) to all variables of the CP. We can conclude that the respondents do not consider the company has "much better" in terms of "overall performance", "return on sales relative", "revenue growth", "return on investments", "return on assets", "growth of market share" and "percentage of sales generated by new products/services" in comparison to the main competitors.

Table 27 - Descriptive statistics of the Competitors Performance construct

Variable	Items	n	Frequency (%)							Mean	Standard Deviation
			1=DT1	2	3	4	5	6	7=CT		
CP7	Overall performance against major competitors.	415	.7	3.9	9.9	22.7	31.1	22.4	9.4	4.84	1.290
CP4	Return on sales relative to the main competitors.	415	.5	3.4	8.9	27.7	29.6	22.7	7.2	4.80	1.221
CP2	Revenue growth in relation to the main competitors.	415	1.0	3.4	12.3	24.6	28.4	21.9	8.4	4.76	1.303
CP6	Return on investments relative to the main competitors.	415	1.0	4.1	10.6	26.0	29.4	20.2	8.7	4.74	1.302
CP5	Return on assets relative to the main competitors.	415	.2	4.6	10.6	26.5	29.2	20.7	8.2	4.75	1.271
CP1	The growth of market share in relation to the main competitors.	415	1.9	4.6	10.6	24.1	29.6	20.0	9.2	4.72	1.369
CP3	The percentage of sales generated by new products / services relative to the main competitors.	415	1.4	5.1	11.8	24.1	27.0	20.0	10.6	4.73	1.398

Source: Field Survey Data

4.2.1 Confirmatory Analysis of Theoretical Framework

Many areas of applied social sciences, has done in the analysis of interdependencies between latent variables, concern empirical research, which has led to a growing interest in the analysis of models of structural equations (Baumgartner & Homburg, 1996; Hair et al., 2016). Götz, Liehr-Gobbers and Krafft (2010) say that this may be one of the most popular methods with which to estimate structural equation models, but it can only be utilized if various requirements concerning data, theory and the operationalization of latent variables are fulfilled. They claim, for instance, in covariance structure analysis the maximum likelihood estimation is frequently used, but it is only efficient and unbiased when the assumption of multivariate normality is met. In addition, the recommendation when the maximum likelihood estimate is used in an analysis based on covariance is a sample size ranging from 150 to 400 is recommended (Hair et al., 2006). To achieve identification within the use of formative measurement models is another requirement for covariance structure analysis (Jarvis, MacKenzie, & Podsakoff, 2003). An option approach to management these issues is the Partial Least Squares (PLS) approach for the analysis of structural equation models. After its frequent initial application in the early 1980s, software packages with which to analyze structural equation models with PLS have become more readily available (LVPLS, PLS-Graph, PLS-GUI, SmartPLS, SPAD PLS, among others).

When applying PLS-SEM, Hair Jr, Sarstedt, Hopkins and Kuppelwieser, (2014) states that is important to follow a multi-stage process, which involves the specification of the inner and outer models, data collection and examination, the actual model estimation, and the evaluation of results. In the following, this review centers about the three most prominent steps:

- (1) Model specification;
- (2) Outer model evaluation;
- (3) Inner model evaluation.

Model specification

The model specification stage is related to the configuration of the internal and external models. The inner model, or structural model, demonstrates the relationships between the constructions being evaluated. Measurement models or external models are used to assess the relationships between the indicator variables and their corresponding construct. The first step in using PLS-SEM involved creating a path model that connected variables and constructions

based on theory and logic (Hair et al., 2014). After creating the path model, constructs were considered exogenous or endogenous (shown in Figure 4), while exogenous constructs act as independent variables and do not have an arrow pointing to them, endogenous constructs are explained by other constructs (exogenous and endogenous).

Outer model evaluation

After the specification of the internal and external models, the next step was to execute the PLS-SEM algorithm and, based on the results, the reliability and validity of the constructs measures in the external models were evaluated. After evaluating the external models, a distinction was made between the constructs measured reflexively and formatively (Hair et al., 2016; Ringle et al., 2011; Sarstedt & Schlotter, 2010).

Inner model evaluation

Reflective indicators consist in a representative set of all possible items within the conceptual domain of a construct (Diamantopoulos & Winklhofer, 2001). Reflective indicators are linked to a construct through loadings, which are the bivariate correlations between the indicator and the construct. When evaluate reflective outer models, it is important verify both the reliability and validity.

4.2.1.1 Reliability and Validity of Model

Hulland (1999) stated when multiple items are used to measure individual latent variables; the researcher should be concerned not only with the reliability of the individual measurement items, but also with the extent to which the measures demonstrate convergent validity. Convergent validity is the measure of the internal consistency. It is estimated to ensure that the items assumed to measure each latent variable measures them and not measuring another latent variable (Aibinu, & Al-Lawati, 2010).

In this case, four tests were used to determine the reliability and convergent validity of the measured constructs:

- Reliability of each latent variable, internal consistency: (1) Cronbach's alpha and the scores of compound reliability (ρ_c), (2) Dillon-Goldstein's ρ_A and (3) Composite Reliability.
- Convergent validity: (4) Average variance extracted (AVE).

In this research, the all of them was generated using SmartPSL3 (2019). Cronbach's alpha is the reliability coefficient (or internal consistency). It measures how well a set of items (or variables) measures a single one dimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low. An alpha score larger than 0.7 is generally acceptable as sufficient accuracy for a construct (Nunnally, 1978). Each construct is embodied by the indicators.

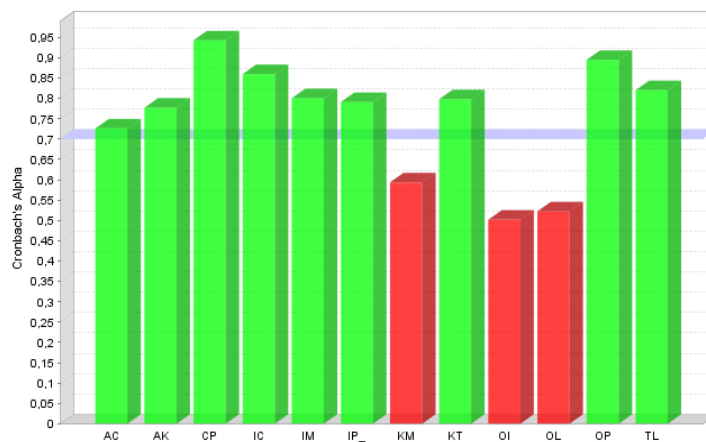
Composite Reliability is similar to Cronbach Alpha. Composite Reliability score is superior to Cronbach's Alpha measure of internal consistency since it uses the item loadings obtained within the theoretical model (Fornell & Larcker, 1981). Cronbach's Alpha weighs all items equally without considering their factor loadings. Nonetheless, the interpretation of Composite Reliability score and Cronbach's Alpha is the same.

Regarding the analysis of Cronbach's alpha coefficients, the first step consisted of purifying the scales. Thus, the Item-Total correlations were evaluated, aiming at the eventual exclusion of items that contributed little to the formation of the constructs. Table 28 below shows that of the original 55 items of the scales, 6 items of 5 constructs were excluded, resulting in 49 items for the 12 constructs that constitute the proposed theoretical framework. Chart 1 shows the Cronbach's alpha coefficients compared to the threshold of .70.

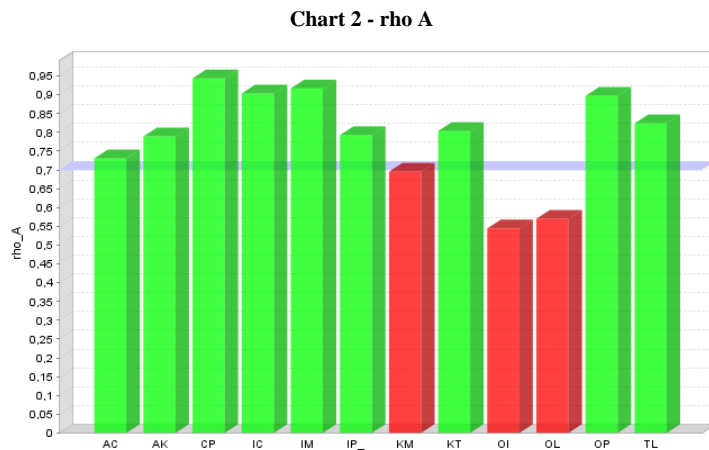
Using Nunnally's 0.7 benchmark for Cronbach's Alpha, Dillon-Goldstein's rho A and Composite Reliability all the constructs demonstrate acceptable level of convergent validity. In Chart 1, all constructions show good reliability, since Cronbach's alpha value is greater than 0.7 for all construct, except for KM (Knowledge Management), OI (Organizational Innovation) and OL (Organizational Learning) whose indexes were below the threshold of 0.70 (KM = 0,593; OI = 0,502 and OL = 0,522).). It should be noted that the fixed level of .70 is arbitrary, denoting a desirable value, notably for the consequent final construct. For mediating constructs, it is possible to carefully flex this rule of thumb.

Table 28 - Excluded items and Cronbach's alpha

Construct	Items	Excluded Items	Cronbach's Alpha
Knowledge Transfer	KT1 thru KT4	KT4	.798
Intrinsic Motivation	IM1 thru IM4	-	.801
Acquired Knowledge	AK1 thru AK5	AK1 e AK2	.777
Innovative Culture	IC1 thru IC7	-	.860
Absorptive Capacity	AC1 thru AC3	AC1	.726
Transformational Leadership	TL1 thru TL5	-	.821
Organizational Learning	OL1 thru OL4	-	.522
Knowledge Management	KM1 thru KM4	KM1	.593
Organizational Innovation	OI1 thru OI3	OI3	.502
Innovation Performance	IP1 thru IP5	-	.791
Concorrential Performance	CP1 thru CP7	-	.943
Organizational Performance	OP1 thru OP4	-	.895

Chart 1 - Cronbach's Alpha

In Chart 2, all constructs show good reliability, since rho A value is greater than 0.7 for all constructions, except for KM (Knowledge Management), OI (Organizational Innovation) and OL (Organizational Learning) whose indexes were below the threshold of 0.70 (KM = 0,696; OI = 0,544 and OL = 0,570).



In Chart 3, all constructions show good reliability, given that the composite reliability indicators are above the threshold 0.7 for all constructs, except for Organizational Learning (OL = 0,694). In this indicator, theoretically more accurate, the measurement items are appropriate for their respective latent variables.

Further, the Average Variance Extracted (AVE) (Fornell & Larcker, 1981) was used to assess the convergent validity of the latent variables. AVE measures the amount of variance that a latent variable captures from its measurement items relative to the amount of variance due to measurement errors. Therefore, it is the proportion of variance for each item ($s^2 = 1$) that is explained by the latent variable. Fornell and Larcker (1981) proposed a threshold of 0.5. This means that at least 50% of the measurement variation is captured by the latent variable. In this study, the strokes' estimates (Chart 4) are above 50% for the latent variables, except for OL (Organizational Learning) = 0,383.

Chart 3 - Composite Reliability

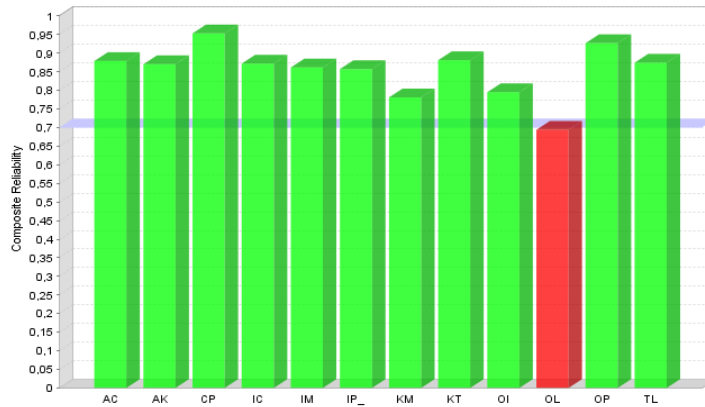
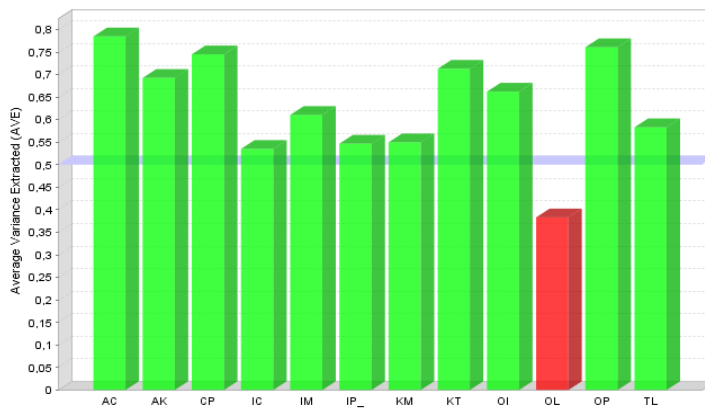


Chart 4 - Average Variance Extracted (AVE)



These results demonstrate that there is convergent validity and good internal consistency in the measurement model. This implies that the measurements items of each latent variable measures them well given that the variance of each item was satisfactorily explained by the respective construct.

Table 29 presented below contains, for the 12 constructs of the theoretical framework, the four indicators of reliability / internal consistency and convergent validity, thus showing an adequate assessment of the measurement model.

Table 29 - Construct Reliability and Convergent Validity

Constructs	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
AC - Absorptive Capacity	0,798	0,731	0,879	0,785
AK - Acquired Knowledge	0,777	0,789	0,871	0,692
CP - Concorrential Performance	0,943	0,944	0,953	0,745
IC - Innovative Culture	0,860	0,903	0,872	0,535
IM - Intrinsic Motivation	0,801	0,917	0,862	0,611
IP - Innovation Performance	0,791	0,793	0,857	0,547
KM - Knowledge Management	0,593	0,696	0,781	0,550
KT - Knowledge Transfer	0,798	0,804	0,881	0,713
OI - Organizational Innovation	0,502	0,544	0,795	0,662
OL - Organizational Learning	0,522	0,570	0,694	0,383
OP - Organizational Performance	0,895	0,897	0,927	0,761
TL - Transformational Leadership	0,821	0,824	0,875	0,583

After assessing the individual item reliability and convergent validity of the measurement model, the discriminant validity of the measurement will be evaluated next.

4.2.1.2 Discriminant Validity

Discriminant validity indicates the extent to which a given latent variable is different from other latent variable in the model (Hulland, 1999). To assess Discriminant Validity, we used the Fornell-Larcker Criterion. The analysis of cross-loading was conducted by following the rule that items should have a higher correlation with the latent variable that they are supposed to measure than with any other latent variable in the model (Chin, 1998). By looking at the cross-loading, the factor loading indicators on the assigned construct have to be higher than all loading of other constructs with condition that the cut-off value of factor loading is higher than 0.70 (Hair, Ringle, & Sarstedt, 2011; Hair Jr, Hult, Ringle, & Sarstedt, 2016).

The Fornell-Lacker criterion it is a method that compares the square root of the average variance extracted (AVE) with the correlation of latent constructs (Hair Jr. et al, (2016). A latent

construct should explain better the variance of its own indicator rather than the variance of other latent constructs. Therefore, the square root of each construct's AVE should have a greater value than the correlations with other latent constructs. Except for Organizational Learning (OL = .619), just below the threshold of 0.70, the other eleven constructs showed adequate discriminant validity.

The outputs are presented in Table 30.

Table 30 - Fornell-Larcker Criterion

Constructs	AC	AK	CP	IC	IM	IP	KM	KT	OI	OL	OP	TL
AC - Absorptive Capacity	0,886											
AK - Acquired Knowledge	0,768	0,832										
CP - Concorrential Performance	0,143	0,150	0,863									
IC - Innovative Culture	0,197	0,170	0,520	0,731								
IM - Intrinsic Motivation	0,189	0,168	0,485	0,818	0,781							
IP - innovation Performance	0,102	0,087	0,570	0,707	0,709	0,739						
KM - Knowledge Management	0,076	0,066	0,486	0,640	0,622	0,712	0,741					
KT - Knowledge Transfer	0,798	0,887	0,161	0,145	0,141	0,080	0,035	0,844				
OI - Organizational Innovation	0,191	0,185	0,396	0,542	0,624	0,568	0,543	0,174	0,814			
OL - Organizational Learning	0,394	0,382	0,670	0,602	0,597	0,635	0,505	0,368	0,532	0,619		
OP - Organizational Performance	0,119	0,114	0,756	0,604	0,551	0,644	0,564	0,115	0,466	0,609	0,872	
TL - Transformational Leadership	0,131	0,093	0,519	0,763	0,767	0,820	0,736	0,071	0,637	0,595	0,623	0,764

In summary, the results achieved in the analysis of reliability / internal consistency, convergent and discriminant validity, show that the measurement model is sufficiently satisfactory to proceed with the analysis of the proposed structural model.

4.2.2 Structural Analysis of Theoretical Framework

Next, the analysis of a set of four indicators related to the structural part of the theoretical framework will be presented, involving the analysis of adjusted explanatory power (R^2_a), effect size (f^2), collinearity (VIF) and the goodness of fit (χ^2).

4.2.1.1 Exploratory Power of the Model

Based on the results, the latent variables are within acceptable level of error, it means that the measurement model has good individual item reliability, convergent validity and discriminant validity. Therefore, the measurement model demonstrates sufficient robustness needed to test the relationship among the independent latent variables and the dependent construct. With satisfactory robustness of the measurement model, the structural model is assessed next to determine the explanatory and predictive power.

The explanatory power of the structural model can be evaluated by examining the amount of variance in the dependent variable which can be explained by the model. According to Breiman and Friedman (1985), the criterion R^2 is critical in evaluating a structural model. Schroeder, Sjoquist and Stephan (2016, p. 25) argue that “ R^2 , the coefficient of determination, measures the percentage of the variation in the dependent variable that is explained by variations in the independent variables taken together”.

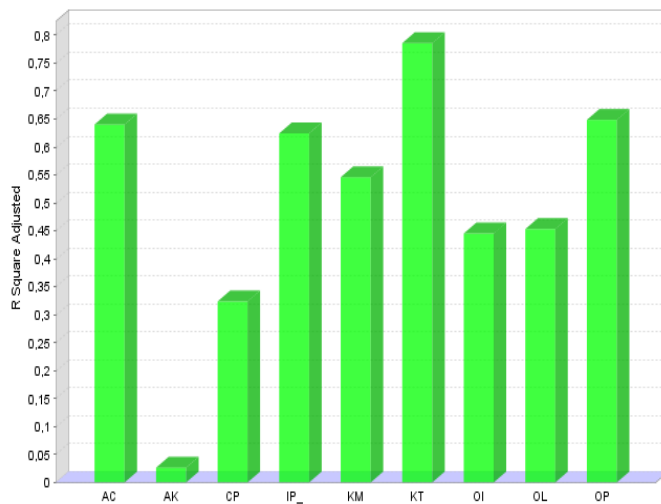
In purely referential terms, values of R^2 next to 0.75, 0.50, or 0.25 for endogenous variables can describe substantial, moderate and weak values, respectively (Hair et al., 2011). The table 31 and chart 6 shows the results. We can notice that the adjusted explanatory power of the Knowledge Transfer construct ($R^2_a = 0,786$) had a substantial value and only Acquired Knowledge ($R^2_a = 0,027$) had a very weak value. Disregarding AK, it can be said that the model is adequate to explain the dependent constructs, as well as the antecedent factors that influence its.

Table 31 - (Adjusted) Explanatory Power

Constructs	R Square	R Square Adjusted
AC - Absorptive Capacity	0,642	0,640
AK - Acquired Knowledge	0,031	0,027
CP - Concorrential Performance	0,325	0,324
IP - Innovation Performance	0,628	0,624
KM - Knowledge Management	0,548	0,546
KT - Knowledge Transfer	0,787	0,786
OI - Organizational Innovation	0,449	0,445
OL - Organizational Learning	0,456	0,453
OP - Organizational Performance	0,653	0,648

It is worth mentioning that the R Square Adjusted (R^2_a) takes into account the complexity of the model and the sample size. They are useful for comparing models and different data sets (Henseler, Hubona, & Ray, 2016).

Chart 5 - R Square Adjusted (R^2_a)



4.2.1.2 Effect Size (f^2)

Effect size is a statistical concept that measures the strength of the relationship between two variables on a numeric scale. This indicator is simply a way of quantifying the size of the difference between two groups. It quantifies the size of the difference between two groups, and may be said to be a true measure of the significance of that difference (Cohen, 1988). As presented by Galhanone (2013), the paths present in the theoretical model must be necessarily evaluated regarding the effect size, in such a way that it is possible to distinguish the paths that most contribute to the explanation of the dependent variable. Therefore, Cohen's f^2 measures the relative impact that an exogenous variable has on an endogenous variable, through changes in the value of R^2 (Hair Jr. et al., 2016), making it possible to assess the effect of each path in the structural model (Ringle et al., 2012). It is generally accepted that for f^2 values above 0.35, 0.15 and 0.02, they can be considered strong, moderate or weak, respectively. (Hair Jr. et al., 2016; Henseler et al., 2016; Urbach & Ahlemann, 2010).

Table 32 - Effect sizes (f^2)

Constructs	AC	AK	CP	IP	KM	KT	OI	OL	OP
AC - Absorptive Capacity								0,186	
AK - Acquired Knowledge						3,593			
CP - Concorrential Performance									0,447
IC - Innovative Culture		0,003				0,000			
IM - Intrinsic Motivation		0,003				0,000			
IP - Innovation Performance			0,483						0,019
KM - Knowledge Management				0,340			0,014		
KT - Knowledge Transfer	1,746			0,020					
OI - Organizational Innovation				0,035					0,002
OL - Organizational Learning				0,199	0,016		0,058		0,000
TL - Transformational Leadership	0,016				0,647		0,119	0,553	0,026

It was found that the relationship between Acquired Knowledge (AK) and Knowledge Transfer (KT) had a very strong effect ($f^2 = 3,593$), followed by the relationship between Knowledge Transfer and Absorptive Capacity with a very strong effect ($f^2 = 1,746$). The following effect sizes can be considered as having a strong impact: the relationship between Transformational Leadership and Knowledge Management ($f^2 = 0,647$), Transformational Leadership and Organizational Learning ($f^2 = 0,553$), Innovation Performance and Competitor Performance ($f^2 = 0,483$), Competitor Performance and Organizational Performance ($f^2 = 0,447$). Can be considered as having a moderate impact the following relationships: Knowledge Management and Innovation Performance ($f^2 = 0,340$), Organizational Learning and Innovation Performance ($f^2 = 0,199$), Absorptive Capacity and Organizational Learning ($f^2 = 0,186$).

On the other hand, they are relatively weak the relationship between Transformational Leadership and Organizational Innovation ($f^2 = 0,119$) Organizational Learning and Organizational Innovation ($f^2 = 0,058$), Transformational Leadership and Organizational Performance ($f^2 = 0,026$). The other relationships did not show significant effects to assess the value of f^2 .

4.2.1.3 Collinearity Statistics (VIF)

To assess the level of collinearity between the formative indicators and relationships between constructs, the variance inflation factor (VIF) for each item and between relationships was calculated. The multicollinearity indicator was used to verify how much a variable is capable of being explained by other variables (Kline, 2015). Tolerance is understood as the extent to which the selected independent variable has not been explained by the other independent variables. The VIF is the inverse of tolerance ($1 / \text{tolerance}$), that is, high tolerance values indicate little collinearity and values close to zero mean that the variable is explained by other variables (Hair et al., 2010). Tolerance is acceptable values that ranged between 0.10 to 1 and absent for values equal to 1. For VIF, multicollinearity is problematic for variables with a value equal to 10, acceptable for values between 1 to 10 and absent for values equal to 1 (Hair et al., 2010). For this purpose, was performed a multiple regression of each indicator of the formatively measured construct on all the other measurement items of the same construct.

Table 33 - Inner VIF Values for Constructs' Items

Indicators	VIF	Indicators	VIF
AC2	1,481	KM2	1,159
AC3	1,481	KM3	1,218
AK3	1,812	KM4	1,356
AK4	1,419	KT1	1,899
AK5	1,775	KT2	1,529
OP1	2,856	KT3	1,825
OP2	2,667	OI1	1,126
OP3	2,022	OI2	1,126
OP4	3,054	OL1	1,155
IC1	2,147	OL2	1,163
IC2	2,133	OL3	1,446
IC3	1,692	OL4	1,426
IC4	1,539	PC1	3,151
IC5	1,805	PC2	3,363
IC6	1,659	PC3	2,304
IM1	1,653	PC4	2,998
IM2	1,833	PC5	3,363

“continua”

“continuação”

IM3	1,532	PC6	3,013
IM4	1,514	PC7	3,985
IP1	1,479	TL1	1,698
IP2	1,782	TL2	1,929
IP3	1,441	TL3	1,681
IP4	1,728	TL4	1,572
IP5	1,310	TL5	1,458

“conclusão”

All items in the constructs (table 32) are below the reference value - rule of thumb of 10 (Hair Jr. et al., 2010) - and are therefore acceptable in terms of low or moderate collinearity.

Table 34 - Inner VIF Values for Constructs' Relationships

Constructs	AC	AK	CP	IP	KM	KT	OI	OL	OP
AC - Absorptive Capacity								1,017	
AK - Acquired Knowledge						1,032			
CP - Concorrential Performance									1,944
IC - Innovative Culture		3,017				3,027			
IM - Intrinsic Motivation		3,017				3,026			
IP - Innovation Performance			1,000						3,486
KM - Knowledge Management				1,622			2,213		
KT - Knowledge Transfer	1,005			1,201					
OI - Organizational Innovation				1,626					1,796
OL - Organizational Learning				1,782	1,549		1,573		2,342
TL - Transformational Leadership	1,005				1,549		2,552	1,017	3,541

We can see from the results of table 33 that 18 out of 24 formative relationships between constructs (75%) are close to one, denoting an insignificant level of multicollinearity. The six other relationships are situated with values just above 3, still within acceptable criteria of the VIF. These results are corroborated by the discriminant validity indicators, which showed significant results of discrimination between the constructs considered in the research.

4.2.1.4 Model-Fit

Absolute fit indices determine how well a priori model fits the sample data (McDonald & Ho, 2002) and demonstrate which proposed model has the most superior fit. Hooper, Coughlan, & Mullen (2008) say that these measures provide the most fundamental indication of how well the proposed theory fits the data. Unlike incremental fit indices, their calculation does not rely on comparison with a baseline model but is instead a measure of how well the model fits in comparison to no model at all (Jöreskog & Sörbom, 1993). In SmartPLS, our indicative statistics of model fit were provided: standardized root mean residual (SRMR), Chi-Squared index and normalized fit index (NFI). The Chi-Square value is the traditional measure for evaluating overall model fit and, “assesses the magnitude of discrepancy between the sample and fitted covariances matrices” (Hu & Bentler, 1999. p.2). A good model fit would provide an insignificant result at a 0.05 threshold (Barrett, 2007), thus the Chi-Square statistic is often referred to as either a ‘badness of fit’ (Kline, 2005) or a ‘lack of fit’ (Mulaik et al, 1989) measure. Birkie et al. (2017), also as a rule of thumb, suggest an appropriate values of $NFI \geq 0.9$ and $SRMR < 0.08$. The results of fit criteria are presented in Table 33. Lohmoller (1989) demonstrates that RMS_theta corresponds to the value given by the root mean squared residual covariance matrix of the outer model residuals. The RMS Theta evaluate the degree to which the outer model residuals correlate. Values close zero indicate good model fit, that is, the correlations between the outer model residuals are very small.

Table 35 - Fit Summary

Indicators	Saturated Model	Estimated Model
SRMR	0,092	0,118
Chi-Square	4.404,045	4.657,378
NFI	0,696	0,678
RMS Theta		0,122

Considering the complexity of the proposed integrative theoretical framework, whose relationships between constructs were based on a rigorous literature review, one can admit the reasonableness of the structural model's adjustment indicators, despite being slightly above (or below) in comparison with the values recommended by the rules of thumb (Hair Jr. et al., 2016).

4.2.1.5 Path Coefficients

Path coefficient analysis developed by Wright (1921, 1923), which is simply a standardized partial regression analysis appears to be helpful in partitioning the correlation coefficients into direct and indirect effects. Summaries of the basic features of this technique and its applications are given by Li (1948, 1956). The estimates for the Path Coefficients are provided after the execution of a PLS model, which represent the hypothetical relationships that connect the constructs. Hair et al. (2014) states the values of the path coefficient are standardized in a range of ± 1 , with coefficients close to ± 1 representing strong positive or negative relationship between constructs.

Hair, Ringle, & Sarstedt (2013) and Albers (2010) say that it is important routinely report the total effects (i.e., the sum of direct and indirect effects between two constructs). Because this not only allows a more complete picture of the mediating constructs' role, but also provides practitioners with actionable results regarding cause-effect relationships.

The path of the structural model is assessed next in the table 34. Test of each hypothesis was achieved by looking at the sign, size, and statistical significance ($p < .10$) of the path coefficients (β) between each predictor latent variable and the dependent variable (Wixom & Watson, 2001). The higher the path coefficient the stronger the effect of a predictor latent variable on the dependent variable.

Table 36 - Path coefficients between constructs

Constructs	AC	AK	CP	IP	KM	KT	OI	OL	OP
AC - Absorptive Capacity								0,321	
AK - Acquired Knowledge						0,889			
CP - Concorrential Performance									0,549
IC - Innovative Culture		0,097				0,005			
IM - Intrinsic Motivation		0,089				-0,013			
IP - Innovation Performance			0,570						0,150
KM - Knowledge Management				0,453			0,129		
KT - Knowledge Transfer	0,793			-0,094					
OI - Organizational Innovation				0,146					0,038
OL - Organizational Learning				0,363	0,105		0,223		0,018
TL - Transformational Leadership	0,075				0,673		0,409	0,553	0,180

Bold: $p < .05$

In order to allow visualization of the statistically significant relationships with the greatest impact, table 35 is presented below, where the path coefficients are in decreasing order from the highest to the lowest impact.

Table 37 - Path coefficients in descending orders

Relationship	Standardized B
AK -> KT	0.889
KT -> AC	0.793
TL -> KM	0.673
IP -> CP	0.570
TL -> OL	0.553
CP -> OP	0.549
KM -> IP	0.453
TL -> OI	0.409
OL -> IP	0.363
AC -> OL	0.321
OL -> OI	0.223
TL -> OP	0.180
IP -> OP	0.150
OI -> IP	0.146
KM -> OI	0.129
OL -> KM	0.105
IC -> AK	0.097
TL -> AC	0.075
OI -> OP	0.038
OL -> OP	0.018
IC -> KT	0.005
IM -> AK	-0.013
KT -> IP	-0.094

Bold: $p < .05$

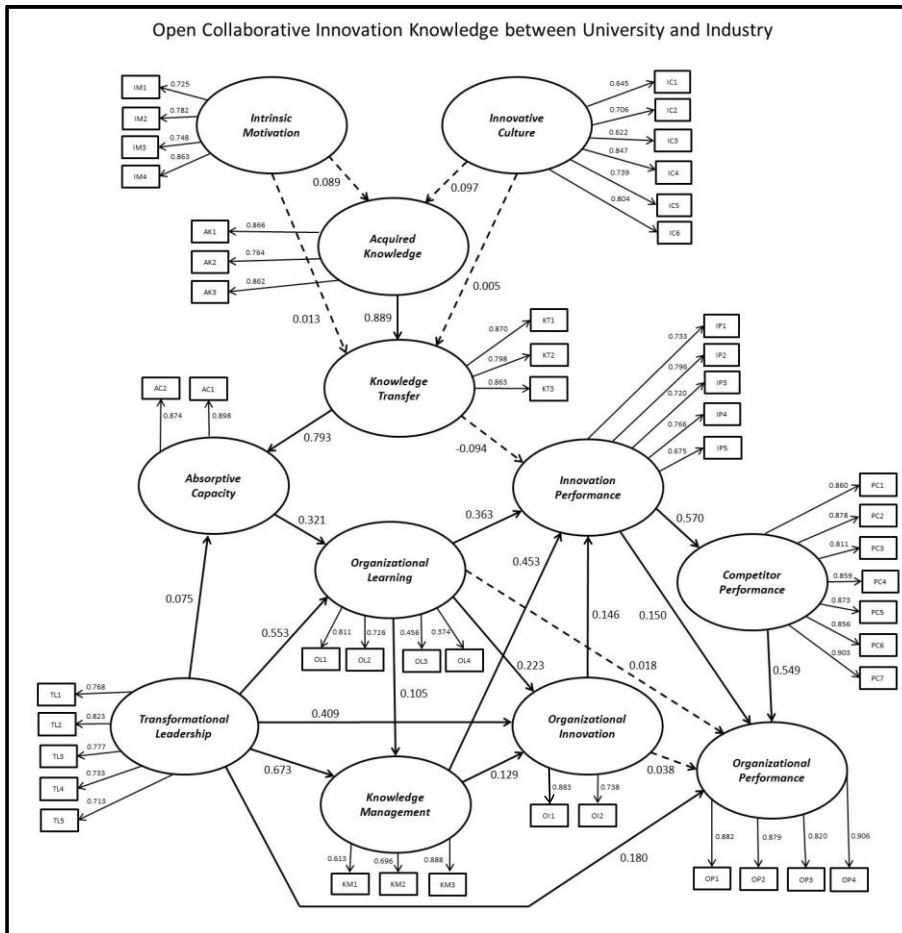
In order to assess the stability of the standardized coefficients of the original sample of 415 cases that responded to all items in the 12 constructs, Bootstrapping analysis of 1,000 random samples was performed. High adherence is observed between both standardized B's for all related constructs considered in the theoretical framework. The values of the T test and the p values indicate which relationships between constructs were statistically significant. The results achieved are shown in table 37 below.

Table 38 - Bootstrapping Analysis

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	p Values
AC -> OL	0,321	0,314	0,081	3,958	0,000
AK -> KT	0,889	0,889	0,013	67,278	0,000
CP -> OP	0,549	0,549	0,049	11,303	0,000
IC -> AK	0,097	0,108	0,107	0,901	0,368
IC -> KT	0,005	0,011	0,050	0,105	0,916
IM -> AK	0,089	0,100	0,098	0,908	0,364
IM -> KT	-0,013	-0,016	0,049	0,271	0,786
IP_ -> CP	0,570	0,570	0,039	14,661	0,000
IP_ -> OP	0,150	0,149	0,062	2,431	0,015
KM -> IP_	0,453	0,453	0,045	10,109	0,000
KM -> OI	0,129	0,127	0,063	2,041	0,041
KT -> AC	0,793	0,793	0,022	36,595	0,000
KT -> IP_	-0,094	-0,091	0,041	2,324	0,020
OI -> IP_	0,146	0,146	0,050	2,930	0,003
OI -> OP	0,038	0,039	0,038	1,017	0,309
OL -> IP_	0,363	0,364	0,053	6,797	0,000
OL -> KM	0,105	0,104	0,055	1,895	0,058
OL -> OI	0,223	0,223	0,052	4,305	0,000
OL -> OP	0,018	0,016	0,059	0,307	0,759
TL -> AC	0,075	0,074	0,030	2,482	0,013
TL -> KM	0,673	0,674	0,042	16,120	0,000
TL -> OI	0,409	0,411	0,063	6,532	0,000
TL -> OL	0,553	0,555	0,046	11,949	0,000
TL -> OP	0,180	0,182	0,060	3,008	0,003

The following figure illustrates the integrative theoretical framework, showing the hypothesized relationships between the constructs, with the respective coefficients (standardized β). Dashed paths indicate a statistically non-significant relationship.

Figure 4 - Results of the Structural Model



Source: Author's creation

Finally, table 37 contains the result of the statistical test of each hypothesis of the proposed theoretical framework.

Table 37 - Result of testing the hypotheses of the proposed theoretical framework

Hypotheses		Reject / Not Rejected
H1	Knowledge Transfer has a positive impact on Absorptive Capacity.	Not reject
H2	Knowledge Transfer has a positive impact on Innovation Performance.	(-)Not reject
H3	Intrinsic Motivation has a positive impact on Knowledge Transfer.	Reject
H4	Intrinsic Motivation has a positive impact on Acquired Knowledge.	Reject
H5	Acquired Knowledge has a positive impact on Knowledge Transfer.	Not reject
H6	Innovative Culture has a positive impact on Acquired Knowledge.	Reject
H7	Innovative Culture has a positive impact on Knowledge Transfer.	Reject
H8	Absorptive Capacity has a positive impact on Organizational Learning.	Not reject
H9	Transformational Leadership has a positive impact on Absorptive Capacity.	Not reject
H10	Transformational Leadership has a positive impact on Organizational Learning.	Not reject
H11	Transformational Leadership has a positive impact on Organizational Innovation.	Not reject
H12	Transformational Leadership has a positive impact on Knowledge Management.	Not reject
H13	Transformational Leadership has a positive impact on Organizational Performance.	Not reject
H14	Organizational Learning has a positive impact on Knowledge Management.	Not reject
H15	Organizational Learning has a positive impact on Organizational Innovation.	Not reject
H16	Organizational Learning has a positive impact on Organizational Performance.	Reject
H17	Organizational Learning has a positive impact on Innovation Performance.	Not reject
H18	Knowledge Management has a positive impact on Innovation Performance.	Not reject
H19	Knowledge Management has a positive impact on Organizational Innovation.	Not reject
H20	Organizational Innovation has a positive impact on Innovation Performance.	Not reject
H21	Organizational Innovation has a positive impact on Organizational Performance.	Reject
H22	Innovation Performance has a positive impact on Organizational Performance.	Not reject
H23	Innovation Performance has a positive impact on Competitor Performance.	Not reject
H24	Competitor Performance has a positive impact on Organizational Performance.	Not reject

Source: Author's creation

5. FINAL CONSIDERATIONS

In this chapter, the conclusions generated by the analysis of the results, the academic and managerial implications of the study, as well as their limitations will be presented. Finally, suggestions for future investigations related to the topic will be demonstrate.

5.1 CONCLUSION AND ACADEMIC IMPLICATIONS

The objective of the empirical study presented was to explore whether, in the open innovation practices, the knowledge that flows across organizational boundaries, during the collaborative University-Industry process, can positively affect Innovation Performance, Organizational Performance and Organizational Innovation in the analysis across companies/industries in Brazil.

The study started with a theoretical review of the literature on the topics studied and a proposal made up of twenty-four hypotheses. Subsequently, the study was carried out using quantitative techniques related to twelve constructs. The hypotheses were tested using a set of research data collected from a survey conducted with employees from all sectors of the industry listed across 783 largest companies in Brazil using structural equation modeling (SEM). Finally, the proposed model was tested and validated based on the statistical analysis of the data collected from 504 employees from innovation departments.

Despite the voluminous literature on open innovation, we know surprisingly little about how knowledge intertwined and flows across universities and organizational boundaries, especially in developing countries. But, we could see that in recent years, the literature has been discussing university-industry collaboration from multiple perspectives. The literature review showed the existence of several concepts about the constructs studied here, but only a few studies developed theoretical framework with some of the constructs presented. We can also consider that no studies were found where they estimates and evaluate theoretical models with the same combination of linear relationship between a set of latent variables, as presented in this study.

In this study, this is the theoretical model that was tested: (1) Knowledge Transfer, Organizational Learning, Knowledge Management, and Organizational Innovation were considered as antecedents of Innovation Performance; (2) Transformational Leadership, Organizational Learning, Organizational Innovation, Innovation Performance, Competitor Performance, were considered as antecedents of Organizational Performance; (3)

Transformational Leadership, Organizational Learning, Knowledge Management were considered as antecedents of Organizational Innovation; (4) Competitor Performance was considered as antecedent of Innovation Performance.

The research also explores whether: (5) Knowledge Transfer affects Absorptive Capacity; Intrinsic Motivation affects Knowledge Transfer and Acquired Knowledge; (6) Acquired Knowledge affects Knowledge Transfer; (7) Innovative Culture affects Acquired Knowledge and Knowledge Transfer; (8) Absorptive Capacity affects Organizational Learning; (9) Transformational Leadership affects Absorptive Capacity, Organizational Learning and Knowledge Management; (10) Organizational Learning affects Knowledge Management.

We investigate the roles that different open innovation partners (Knowledge Transfer; Intrinsic Motivation; Acquired Knowledge; Innovative Culture; Absorptive Capacity; Transformational Leadership; Organizational Learning; Knowledge Management) have played in improving Organizational Innovation, Innovation Performance, Organizational Performance and Competitor Performance. The questionnaire in this part consists of questions that aim to identify the attitudes of respondents to the constructs proposed above, using previously tested and validated scales.

The theoretical model presented shows robustness in relation to the validity tests and the tests carried out, both at the level of the measurement items and in the structural model. Disregarding Acquired Knowledge, it can be said that the model is adequate to explain the dependent constructs, as well as the antecedent factors that influence its.

The study showed that Knowledge Transfer has a positive impact on Absorptive Capacity, coherent with Katz and Allan (1982), Minbaeva, Pedersen, Björkman, Fey and Park (2003), as well as Szulanski (1996), Foss and Pedersen (2002).

Absorption capacity plays an important role as a source of knowledge, specified by Cohen and Levinthal (1990). The absorption capacity influences mainly in relation to the recipient of this knowledge (Jansen, Van den Bosch, & Volberda, 2005; Minbaeva, et al., 2003; Van den Bosch, Volberda, & De Boer, 1999). Other researchers have argued that a measure of absorption capacity should be based on relevant technological capabilities, in which there is overlap between partners (Lane & Lubatkin, 1998; Mowery, Oxley & Silverman, 1996). In other words, knowledge transfer will occur more efficiently in technological areas that both partners understand well, and not in technological areas, where one of the partners is not technologically competent. Thus, the study evidenced that the intensity of the effort for the Knowledge Transfer in the context of the Absorption Capacity between Universities and Companies differs dramatically from other knowledge absorption configurations.

These results show that, something that complement the existing studies on Knowledge Transfer (Gupta, & Govindarajan, 2000; Szulanski, 1996, 2000), is that the characteristics of the knowledge source and the characteristics of the knowledge receptors (that is, absorption capacity), as well as their relationship, are interdependent elements in the Knowledge Transfer process. In the theory of Absorption Capacity: "The ability to evaluate and use external knowledge is largely a function of the level of knowledge" (Cohen & Levinthal, 1990, p. 128). This theory thus show that this study also have implications in this argument presented. Reinforcing this result related with the impact of absorption capacity on knowledge transfer is the important issue where absorption capacity is defined as the capacity to absorb new knowledge (Cohen & Levinthal, 1989, 1990). There is a relationship between the two constructs, in which the absorption capacity provides the recipient of knowledge with the ability to absorb external knowledge, but the way the recipient reacts to that capacity represents a different process.

Another relevant result of this study refers to the Acquired Knowledge generated by the Intrinsic Motivation arising from the relationship with universities and its consequent Knowledge Transfer to the organizations. The idea was that employees with high levels of Intrinsic Motivation would tend to recognize and evaluate the knowledge and skills acquired in the University to apply in their current jobs. In other words, our expectation was that employees' Intrinsic Motivation would be based on the Acquired Knowledge and their "successful" Knowledge Transfer in the collaborative process with the Universities.

Surprisingly we did not find support for the relationship between Intrinsic Motivations and Acquired Knowledge. Also we didn't find support for the relationship Intrinsic Motivations and Knowledge Transfer. This runs contrary to prior research that suggests that social relationships are closely linked to high levels of Intrinsic Motivations and Knowledge Transfer (Cabrera, Collins, & Salgado, 2006; Mudambi, Mudambi, & Navarra, 2004; Osterloh & Frey, 2000; Osterloh, Frost, & Frey, 2002; Tho & Trang, 2015; Ko et al., 2005).

Another correlation in which wasn't found support was the relationship between Innovative Culture and Acquired Knowledge. In opposition to Tho and Trang (2015) in previous research that suggest that Innovative Culture offers an opportunity for employees in service to acquire more knowledge and skills from University to improve their capabilities. Other result which was the opposite of expectations was the relationship between Innovative Culture and Acquired Knowledge. But in this case, it was according to Tho (2017) who says that "Innovative Culture, improves Intrinsic Motivation and Acquired Knowledge, but not Knowledge Transfer".

On the other hand, during the period of contact between employees and Universities, they Acquire Knowledge from Universities. This is a process of Acquiring Knowledge from universities and Transferring Knowledge to the company. The effectiveness of this process is reflected in the knowledge and skills acquired by employees. Several factors can contribute to the level of knowledge and skills acquired, such as capacity, academic background, motivation, interest and absorption capacity of employees. As we have already seen, Absorptive Capacity refers to the ability, based on your previous knowledge, to recognize the value of new knowledge, to absorb it and apply it to a specific purpose. According to Tho's view (2017), Acquired Knowledge is a determinant of Knowledge Transfer. This study also proved that the knowledge and skills acquired by the employees are important for the effectiveness of Knowledge Transfer by Universities to the Companies. Employees are likely to realize that universities provide them with useful and relevant knowledge and skills for their current jobs, and that they can apply that knowledge and skills acquired to strengthen their career, thus being one of the main objectives that encourage them to look for universities. For, the knowledge and skills acquired reflect the employee's ability.

Thus, we can conclude that the two initial antecedent constructs are not significant, being one of an individual and psychological nature (Intrinsic Motivation) and another of an organizational nature (Innovative Culture), demonstrating that there is a problem in the way employees perceive the companies that they work. If we consider, the statement by Blumenfeld, Kempner and Krajcik (2006, p. 476), which says that "motivation sets the stage for cognitive engagement. Motivation leads to achievement, increasing the quality of cognitive engagement" (cognitive engagement is defined by Fredericks, Blumenfeld and Paris (2004) as the level of investment in learning, including a proactive approach to activities and a willingness to make the effort necessary to understand complex ideas or difficult skills). And that Tho and Trang (2015) states that an organization that creates and nurtures an Innovative Culture will give an opportunity to the organization's employees.

We can conclude that the employees are not motivated, have no disposition or want to make the necessary effort, to Acquire Knowledge from the Universities. Those companies do not promote a learning environment, encouraging their employees to improve their learning capacity. In other words, they do not emphasize innovation or cultivate the ability to adopt new ideas, processes or new ways of performing tasks, offer opportunities for employees to Acquire Knowledge and skills from Universities. That is also, there is no Intrinsic Motivation or Innovative Culture to Transfer Knowledge from Universities to Company.

As far as we know, it is one of the first surveys that address the importance of Acquired and Transfer Knowledge between University and Industry in Brazil, clarifying this type of Knowledge Transfer channel, not investigated by previous research. Theoretically, this study fills a gap in the process of knowledge transfer, in the acquired and transfer of knowledge from universities to companies in Brazil and further strengthens the theoretical aspects of the SEM model. The results provide further support for the theoretical foundation of Foss and Pedersen (2002).

Therefore, this study indicated that Knowledge Transfer does not occur directly for Innovation Performance, but, its effect occurs via Absorptive Capacity and Organizational Learning (Hung, Lien, Yang, Wu, & Kuo, 2011; Calantone, Cavusgil, & Zhao, 2002; Newey & Zahra, 2009; Liao, Fei, & Liu, 2008; Hung, Lien, Yang, Wu, & Kuo, 2011; Aragón-Correa et al., 2007). They are constructs that mediate the Knowledge Transfer effect.

Knowledge Transfer was defined as the combined processes of transmitting and receiving knowledge within or between firms by Grant (1996b). The research indicates the importance of Knowledge Transfer in an integrated analysis of internal and external determinants in research on Organizational Innovation, Innovation Performance, Organizational Performance and competitive advantages, strengthening the previous literature on the importance of the relationships between all the variables mentioned above.

Also, Organizational Learning does not directly impact Organizational Performance, but with Innovation Performance and indirectly with Innovation Performance via Organizational Innovation. Coherent with Stata (1989), McKee, 1992, Argyris and Schon (1997), Gerybadze and Reger (1999), Weerawardena, O'Cass and Julian (2006), Aragón-Correa et al. (2007), Greve (2005), Liao and Wu (2010) and Noruzy et al. (2013).

Specifically, Organizational Learning is a social process in which employees interact to build meaning and knowledge about action-outcome relationships and the effects of the organization's context (learning environment) on those relationships (Brown & Duguid, 1991; Duncan, 1979).

Thus, we conclude that Brazilian companies encourage the acquisition of knowledge, information distribution, information interpretation and organizational memory that can influence positive organizational changes in the context of the organization, bringing benefits Organizational Innovation and Innovation Performance.

They are five constructs that mediate the Transformational Leadership to Organizational Performance. The effect of Transformational Leadership is directly on Organizational Performance (Noruzy et al., 2013, Bass & Bass, 1985, Schön & Argyris, 1996, Glynn, 1996,

Hurley & Hult, 1998, Senge et al., 1994; Lewin, Lippitt, & White, 1939), as well as indirectly via Absorptive Capacity (Zahra, Filatotchev, & Wright, 2009; Espejo & Dominici, 2017; Flatten, Adams, & Brettel, 2015), Organizational Learning (Nevis, DiBella, & Gould, 1997; Gephart & Marsick, 1996; Goh, 1998; Neeffe, 2001; Willcoxson, 2001; James, 2003; Hoveyda, 2007; Leithwood, Leonard, & Sharratt, 1998; Lam, 2002; Chang & Lee, 2007; Abbasi & Zamani-Miandashti, 2013; Noruzy et al., 2013; Aragón-Correa et al., 2007; Snell, 2001; Amitay, Popper & Lipshitz, 2005; Liao, Fei, & Liu, 2008; Aragón-Correa et al., 2007), Knowledge Management (Vincent, 2006; Birasnav, 2014; Bryant, 2003; Han, Seo, Yoon, & Yoon, 2016; Noruzy et al., 2013) and Organizational Innovation (Bass, 1985; Jung, Chow & Wu, 2003; Gumusluoglu & Ilsev, 2009; Chang, 2016; Tajasom, Hung, Nikbin, & Hyun, 2015; Noruzy et al., 2013). Therefore, this construct is very important in terms of the effect on Organizational Performance.

Senge et al. (1999) stated that transformational leaders are those capable of training human resources and enabling changes, thus improving the Organization's Performance in global markets. Although we conclude that employees are not intrinsic motivated to Acquire knowledge and the Brazilian companies do not promote a learning environment, encouraging their employees to improve their learning capacity, the results of the Transformational Leadership were extremely significant. The results testify that companies encourage employees to implement changes at the organizational level and to facilitate innovation and Organizational Learning, thus generating a shared and inspiring vision for the future. Seeing the four dimensions of Transformational Leadership presented by Bass (1985): idealized influence, individualized consideration, intellectual stimulation and inspiring motivation. The study reveals that individualized consideration (focuses on identifying individual employee needs and empowering followers to create a learning climate - Lowe, Kroeck and Sivasubramaniam, 1996, mobilizing employees to goals at the organizational level - Osong, 2006) and inspiring motivation (focuses on encouraging human resources, establishing a higher level of expectations desired for them) is an issue that definitely needs to be widely worked on Brazilian companies. On the other hand, intellectual stimulation (drives knowledge sharing within the company to generate more innovative ideas and solutions), the results indicate that this is the strongest dimension of the four presented by Bass (1985). Concludes that, there is an incentive to share knowledge within the company, but from inside to inside and not from outside to inside. Final conclusion, we could realize that of the 24 hypotheses, 18 were not rejected (they were confirmed). Therefore, the proposed integrative theoretical framework proved to be quite consistent and contributory. These results were evidenced only due to the integrating character

of the theoretical structure, something that other authors have done only partially for some relationships.

5.2 MANAGERIAL IMPLICATIONS

The results of this study helped to understand and analyze how companies in Brazil are organized in the transfer, absorption, motivation, acquisition and management of knowledge and its consequences on organizational innovation, learning innovation, transformational leadership, innovation performance and organizational performance, in the collaborative process between universities and companies.

Therefore, in the age of the knowledge economy, companies must consider external and internal determinants. Investments in the external determinant - learning from the relationship - in order to help in absorption of the external knowledge coming from University-Industry collaboration, through the internal determinants - the Intrinsic Motivation, Acquired Knowledge, Innovative Culture, Absorptive Capacity, Organizational Learning, Transformational Leadership, Knowledge Management. Because the consequences of this relationship, will be very important for companies to improve their Organizational Innovation, Innovation Performance, Organizational Performance and competitive advantages.

Thus, a business organization must encourage its employees, to apply their knowledge and skills acquired by universities in their work, establishing and nurturing an innovative culture within the organization. The innovative culture not only encourages employees of the organization to transfer their knowledge and skills to the organization, but also motivates them to invest adequately in acquiring knowledge and skills from universities. The innovative culture also enhances the intrinsic motivation of employees to transfer their knowledge and skills to the organization. As noted earlier, based on the results of Tho and Trang (2015), innovative culture is also an important factor, necessary to form sufficient conditions for the occurrence of knowledge transfer.

Employees must understand the importance of their role in Knowledge Transfer process, as they simultaneously play two roles in the process: the role of channel and Knowledge Transfer source. While playing the role of channel, employees take the Acquired Knowledge from their relationship with Universities to the daily work in their business organizations. They are the source of Knowledge Transfer. The relevance and usefulness of the Acquired Knowledge depends on two things (channel and source), its ability to identify, assimilate and apply it to the real world (that is, its Absorption Capacity) and its motivation to learn new

knowledge from the relation to Universities. Therefore, employees must understand their two important roles in the Acquired Knowledge process to Transfer Knowledge from the relationship with the University to business organizations more effectively.

5.3 LIMITATIONS AND RECOMMENDATIONS FOR FUTURE STUDIES

This study contains a number of limitations that deserve discussion.

We can say that there is a lack of methods that can capture aspects of the knowledge transfer process and absorption capacity between universities and companies.

Other limitation of this study is the investigation of only one determinant of Acquired Knowledge (Knowledge Transfer) from Universities to Companies. Several other determinants (for example, motivation to learn, learning process, absorption capacity and autonomy at work) can contribute to the effectiveness of this type of acquired knowledge. For example, the learning process can affect the knowledge acquired by employees, which in turn improves their knowledge transfer. Organizational characteristics such as organizational culture (Chang & Lin, 2015), individual employee characteristics such as personality traits (Wilson, Huang, & Kraiger, 2013) and psychological, general capital or its components (hope, optimism, resilience and self-efficacy; Luthans et al., 2015) can act as moderators on the effects of acquired knowledge and knowledge transfer. Future research should examine these potential antecedents and/or moderators.

Future studies can explore the company's absorptive capacity and the consequences of that capacity over a period of time. Future research should also explore how knowledge-absorption capacity differs, depending on the perspective of the source of knowledge initiation (Universities) or the recipient of the knowledge recipient (companies). Another example, future research could examine if developed countries are source of a knowledge-absorbing process different than developing countries.

Finally, we hope that the research results can be useful for companies, researchers or governments and it contribute not only to relevant studies and future research, but also to the development of innovation in Brazil.

REFERENCES

- Abbasi, E., & Zamani-Miandashti, N. (2013). The role of transformational leadership, organizational culture and organizational learning in improving the performance of Iranian agricultural faculties. *Higher Education*, 66(4), 505-519.
- ABDI and ANPEI, (2007). Projeto: Atração de Investimentos de Pesquisa e Desenvolvimento de Empresas Transnacionais. Associação Nacional de Pesquisa e Desenvolvimento, Brasil.
- Achidi Ndofor, H., & Priem, R. L. (2011). Immigrant entrepreneurs, the ethnic enclave strategy, and venture performance. *Journal of Management*, 37(3), 790-818.
- Adobor, H. (2006). Inter-firm collaboration: configuration and dynamics. *Competitiveness Review: An International Business Journal*, 16(2), 122-134.
- Agrawal, A. K. (2001). University-to-industry knowledge transfer: Literature review and unanswered questions. *International Journal of management reviews*, 3(4), 285-302.
- Aibinu, A. A., & Al-Lawati, A. M. (2010). Using PLS-SEM technique to model construction organizations' willingness to participate in e-bidding. *Automation in construction*, 19(6), 714-724.
- Ait Razouk, A. (2011). High-performance work systems and performance of French small-and medium-sized enterprises: examining causal order. *The International Journal of Human Resource Management*, 22(02), 311-330.
- Akaike, H. (1973). Information theory and an extension of the maximum likelihood principle. In Petrov, B. N., & Csaki, F. (Eds.), *Proceedings of the 2nd International Symposium on Information Theory*. Budapest: Akademia Kiado (pp. 267-281).
- Alavi, M., & Leidner, D. E. (2001). Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.
- Alavi, M., & Tiwana, A. (2003). Knowledge management: The information technology dimension. *The Blackwell handbook of organizational learning and knowledge management*, 104-121.
- Albino, V., Garavelli, A. C., & Schiuma, G. (1998). Knowledge transfer and inter-firm relationships in industrial districts: the role of the leader firm. *Technovation*, 19(1), 53-63.
- Al-Husseini, S., & Elbeltagi, I. (2015). Knowledge sharing practices as a basis of product innovation: A case of higher education in Iraq. *International Journal of Social Science and Humanity*, 5(2), 182.
- Ali, M., & Park, K. (2016). The mediating role of an innovative culture in the relationship between absorptive capacity and technical and non-technical innovation. *Journal of Business Research*, 69(5), 1669-1675.
- Amabile, T. M. (1998). *How to kill creativity* (Vol. 87). Boston, MA: Harvard Business School Publishing.

- Amabile, T. M., Hill, K. G., Hennessey, B. A., & Tighe, E. M. (1994). The Work Preference Inventory: assessing intrinsic and extrinsic motivational orientations. *Journal of personality and social psychology*, 66(5), 950.
- Amirkhanyan, A. A., Kim, H. J., & Lambright, K. T. (2013). The performance puzzle: Understanding the factors influencing alternative dimensions and views of performance. *Journal of Public Administration Research and Theory*, 24(1), 1-34.
- Amitay, M., Popper, M., & Lipshitz, R. (2005). Leadership styles and organizational learning in community clinics. *The Learning Organization*, 12(1), 57-70.
- Andersen, L. B., Boesen, A., & Pedersen, L. H. (2016). Performance in public organizations: Clarifying the conceptual space. *Public Administration Review*, 76(6), 852-862.
- Andersen, P. H., & Drejer, I. (2008). Systemic innovation in a distributed network: the case of Danish wind turbines, 1972—2007. *Strategic Organization*, 6(1), 13-46.
- Andreeva, T., & Kianto, A. (2011). Knowledge processes, knowledge-intensity and innovation: a moderated mediation analysis. *Journal of Knowledge Management*, 15(6), 1016-1034.
- Aragón-Correa, J. A., García-Morales, V. J., & Cerdón-Pozo, E. (2007). Leadership and organizational learning's role on innovation and performance: Lessons from Spain. *Industrial marketing management*, 36(3), 349-359.
- Argote L. (2013) *Organizational learning: creating, retaining and transferring knowledge*. 2nd ed. Norwell, MA: Kluwer Academic Publishers.
- Argote, L., & Ingram, P. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational behavior and human decision processes*, 82(1), 150-169.
- Argote, L., & Miron-Spektor, E. (2011). Organizational learning: From experience to knowledge. *Organization science*, 22(5), 1123-1137.
- Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management science*, 49(4), 571-582.
- Argyris, C., & Schön, D. A. (1997). Organizational learning: A theory of action perspective. *Reis*, (77/78), 345-348.
- Arora, A., Fosfuri, A., & Gambardella, A. (2001). *Markets for technology: The economics of innovation and corporate strategy*. MIT press.
- Baba, Y., Shichijo, N., & Sedita, S. R. (2009). How do collaborations with universities affect firms' innovative performance? The role of "Pasteur scientists" in the advanced materials field. *Research Policy*, 38(5), 756-764.
- Bader, K., & Enkel, E. (2014). Understanding a firm's choice for openness: strategy as determinant. *International Journal of Technology Management* 23, 66(2-3), 156-182.
- Barge-Gil, A. (2013). Open strategies and innovation performance. *Industry and Innovation*, 20(7), 585-610.

- Barnes, T., Pashby, I., & Gibbons, A. (2002). Effective University–Industry Interaction: A Multi-case Evaluation of Collaborative R&D Projects. *European Management Journal*, 20(3), 272-285.
- Barrett, P. (2007). Structural equation modeling: Adjudging model fit. *Personality and Individual Differences*, 42(5), 815-824.
- Barton, D. L. (1995). *Wellsprings of knowledge: Building and sustaining the sources of innovation*. Harvard Business School.
- Bass, B. M., & Bass Bernard, M. (1985). Leadership and performance beyond expectations.
- Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Psychology press.
- Bass, B. M., Avolio, B. J., Jung, D. I., & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of applied psychology*, 88(2), 207.
- Bass, B., & Avolio, B. (1995). *MLQ multifactor leadership questionnaire*. Mind Garden.
- Baum, S., O'Connor, K., & Yigitcanlar, T. (2008). The implications of creative industries for regional outcomes. *International Journal of Foresight and Innovation Policy*, 5(1-3), 44-64.
- Baumgartner, H., & Homburg, C. (1996). Applications of structural equation modeling in marketing and consumer research: A review. *International journal of Research in Marketing*, 13(2), 139-161.
- Bekkers, R., & Freitas, I. M. B. (2008). Analysing knowledge transfer channels between universities and industry: To what degree do sectors also matter?. *Research policy*, 37(10), 1837-1853.
- Belderbos, R., Carree, M., & Lokshin, B. (2004b). Cooperative R&D and firm performance. *Research policy*, 33(10), 1477-1492.
- Belderbos, R., Carree, M., Diederen, B., Lokshin, B., & Veugelers, R. (2004a). Heterogeneity in R&D cooperation strategies. *International journal of industrial organization*, 22(8-9), 1237-1263.
- Bell, D. (1976). The coming of the post-industrial society. In *The Educational Forum* (Vol. 40, No. 4, pp. 574-579). Taylor & Francis Group.
- Bengtsson, M., Eriksson, J., & Wincent, J. (2010). Coopetition: new ideas for a new paradigm. *Coopetition: Winning strategies for the 21st century*, 19-39.
- Benitez, J., Henseler, J., Castillo, A., & Schuberth, F. (2019). How to perform and report an impactful analysis using partial least squares: Guidelines for confirmatory and explanatory IS research. *Information & Management*.
- Bentler, P. M. (1990). Fit indexes, Lagrange multipliers, constraint changes and incomplete data in structural models. *Multivariate Behavioral Research*, 25(2), 163-172.

- Berchicci, L. (2013). Towards an open R&D system: Internal R&D investment, external knowledge acquisition and innovative performance. *Research Policy*, 42(1), 117-127.
- Bercovitz, J., & Feldman, M. (2006). Entrepreneurial universities and technology transfer: A conceptual framework for understanding knowledge-based economic development. *The Journal of Technology Transfer*, 31(1), 175-188.
- Bergen, M., & Peteraf, M. A. (2002). Competitor identification and competitor analysis: a broad-based managerial approach. *Managerial and decision economics*, 23(4-5), 157-169.
- Berson, Y., Nemanich, L. A., Waldman, D. A., Galvin, B. M., & Keller, R. T. (2006). Leadership and organizational learning: A multiple levels perspective. *The leadership quarterly*, 17(6), 577-594.
- Bettis, R. A., & Hitt, M. A. (1995). The new competitive landscape. *Strategic management journal*, 16(S1), 7-19.
- Birasnav, M. (2014). Knowledge management and organizational performance in the service industry: The role of transformational leadership beyond the effects of transactional leadership. *Journal of business research*, 67(8), 1622-1629.
- Birasnav, M., Chaudhary, R., & Scillitoe, J. (2019). Integration of social capital and organizational learning theories to improve operational performance. *Global Journal of Flexible Systems Management*, 20(2), 141-155.
- Birkie, S. E., Trucco, P., & Campos, P. F. (2017). Effectiveness of resilience capabilities in mitigating disruptions: leveraging on supply chain structural complexity. *Supply Chain Management: An International Journal*.
- Birkinshaw, J., Hamel, G., & Mol, M. J. (2008). Management innovation. *Academy of management Review*, 33(4), 825-845.
- Björkman, I., & Budhwar, P. (2007). When in Rome...? Human resource management and the performance of foreign firms operating in India. *Employee Relations*, 29(6), 595-610.
- Blumenfeld, P. C., Kempner, T. M., & Krajcik, J. S. (2006). *Motivation and cognitive engagement in learning environments*. na.
- Blumenthal, D. (2003). Academic-industrial relationships in the life sciences.
- Boerner, S., Eisenbeiss, S. A., & Griesser, D. (2007). Follower behavior and organizational performance: The impact of transformational leaders. *Journal of Leadership & Organizational Studies*, 13(3), 15-26.
- Bontis, N., Crossan, M. M., & Hulland, J. (2002). Managing an organizational learning system by aligning stocks and flows. *Journal of management studies*, 39(4), 437-469.
- Bower, D. J. (1993). Successful joint ventures in science parks. *Long Range Planning*, 26(6), 114-120.

- Bozeman, B., & Boardman, C. (2014). Assessing research collaboration studies: A framework for analysis. In *Research Collaboration and Team Science*(pp. 1-11). Springer, Cham.
- Breiman, L., & Friedman, J. H. (1985). Estimating optimal transformations for multiple regression and correlation. *Journal of the American statistical Association*, *80*(391), 580-598.
- Brockman, B. K., & Morgan, R. M. (2003). The role of existing knowledge in new product innovativeness and performance. *Decision sciences*, *34*(2), 385-419.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization science*, *2*(1), 40-57.
- Brown, S. L., & Eisenhardt, K. M. (1995). Product development: Past research, present findings, and future directions. *Academy of management review*, *20*(2), 343-378.
- Bryant, S. E. (2003). The role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. *Journal of Leadership & Organizational Studies*, *9*(4), 32-44.
- Burns, J.M. (1978). *Leadership*. New York: Harper and Row.
- Cabrera, A., Collins, W. C., & Salgado, J. F. (2006). Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management*, *17*(2), 245-264.
- Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial marketing management*, *31*(6), 515-524.
- Cameron, K. S., & Quinn, R. E. (2011). *Diagnosing and changing organizational culture: Based on the competing values framework*. John Wiley & Sons.
- Camisón, C., & Forés, B. (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement. *Journal of Business Research*, *63*(7), 707-715.
- Camisón, C., & Villar-López, A. (2014). Organizational innovation as an enabler of technological innovation capabilities and firm performance. *Journal of business research*, *67*(1), 2891-2902.
- Camps, J., & Luna-Arocas, R. (2012). A matter of learning: How human resources affect organizational performance. *British Journal of Management*, *23*(1), 1-21.
- Canty, L. T. (2005). *Conceptual assessment: Transformational, transactional and laissez-faire leadership styles and job performances of managers as perceived by their direct reports* (Doctoral dissertation, Capella University).
- Caputo, M., Lamberti, E., Cammarano, A., & Michelino, F. (2016). Exploring the impact of open innovation on firm performances. *Management Decision*, *54*(7), 1788-1812.
- Carmeli, A., & Tishler, A. (2004). The relationships between intangible organizational elements and organizational performance. *Strategic management journal*, *25*(13), 1257-1278.

- Carrillo, F. J., Yigitcanlar, T., García, B., & Lönnqvist, A. (2014). *Knowledge and the city: Concepts, applications and trends of knowledge-based urban development*. Routledge.
- Casper, S. (2013). The spill-over theory reversed: The impact of regional economies on the commercialization of university science. *Research Policy*, 42(8), 1313-1324.
- Cassiman, B., & Veugelers, R. (2002). R&D cooperation and spillovers: some empirical evidence from Belgium. *American Economic Review*, 92(4), 1169-1184.
- Cerasoli, C. P., Nicklin, J. M., & Ford, M. T. (2014). Intrinsic motivation and extrinsic incentives jointly predict performance: A 40-year meta-analysis. *Psychological bulletin*, 140(4), 980.
- Chandrashekhar, L. (2004). Information and knowledge management as a key leader function.
- Chang, C. L. H., & Lin, T. C. (2015). The role of organizational culture in the knowledge management process. *Journal of Knowledge management*.
- Chang, S. C., & Lee, M. S. (2007). A study on relationship among leadership, organizational culture, the operation of learning organization and employees' job satisfaction. *The learning organization*.
- Chang, Y. Y. (2016). Multilevel transformational leadership and management innovation. *Leadership & Organization Development Journal*.
- Chang, Y. Y., Gong, Y., & Peng, M. W. (2012). Expatriate knowledge transfer, subsidiary absorptive capacity, and subsidiary performance. *Academy of Management Journal*, 55(4), 927-948.
- Chen, C. J., & Huang, J. W. (2009). Strategic human resource practices and innovation performance—The mediating role of knowledge management capacity. *Journal of business research*, 62(1), 104-114.
- Chen, C. J., & Huang, Y. F. (2010). Creative workforce density, organizational slack, and innovation performance. *Journal of Business Research*, 63(4), 411-417.
- Chen, M. J., Su, K. H., & Tsai, W. (2007). Competitive tension: The awareness-motivation-capability perspective. *Academy of management Journal*, 50(1), 101-118.
- Chen, S. H., Tao, C. Q., & He, W. (2012). Empirical research on relationship of knowledge integration and innovation ability of IT enterprise. *International Journal of Networking and Virtual Organizations*, 11(3/4), 315-328.
- Chen, Y. S., Lin, M. J. J., & Chang, C. H. (2009). The positive effects of relationship learning and absorptive capacity on innovation performance and competitive advantage in industrial markets. *Industrial Marketing Management*, 38(2), 152-158.
- Cheng, C. C., & Shiu, E. C. (2015). The inconvenient truth of the relationship between open innovation activities and innovation performance. *Management Decision*, 53(3), 625-647.
- Cheng, C. F., Chang, M. L., & Li, C. S. (2013). Configural paths to successful product innovation. *Journal of Business Research*, 66(12), 2561-2573.

- Chesbrough, H. (2004). Managing open innovation. *Research-Technology Management*, 47(1), 23-26.
- Chesbrough, H. W. (2003a). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.
- Chesbrough, H., & Bogers, M. (2014). Explicating open innovation: Clarifying an emerging paradigm for understanding innovation. *New Frontiers in Open Innovation*. Oxford: Oxford University Press, Forthcoming, 3-28.
- Chesbrough, H., & Crowther, A. K. (2006). Beyond high tech: early adopters of open innovation in other industries. *R&d Management*, 36(3), 229-236.
- Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.). (2006). *Open innovation: Researching a new paradigm*. Oxford University Press on Demand.
- Cheung, G. W. (2008). Testing equivalence in the structure, means, and variances of higher-order constructs with structural equation modeling. *Organizational Research Methods*, 11(3), 593-613.
- Chiang, Y. H., & Hung, K. P. (2010). Exploring open search strategies and perceived innovation performance from the perspective of inter-organizational knowledge flows. *R&d Management*, 40(3), 292-299.
- Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research*, 295(2), 295-336.
- Cho, H. J., & Pucik, V. (2005). Relationship between innovativeness, quality, growth, profitability, and market value. *Strategic management journal*, 26(6), 555-575.
- Cho, J. J., Ozment, J., & Sink, H. (2008) Logistics capability, logistics outsourcing and firm performance in an e-commerce market. *Int J Phys Distrib Logist Manag* 38(5):336-359
- Churchill, G. A., & Iacobucci, D. (2006). *Marketing research: methodological foundations*. New York: Dryden Press.
- Clark, B. H. (2011). Managerial identification of competitors: accuracy and performance consequences. *Journal of Strategic Marketing*, 19(3), 209-227.
- Clark, B. H., & Montgomery, D. B. (1996). Perceiving competitive reactions: the value of accuracy (and paranoia). *Marketing Letters*, 7(2), 115-129.
- Clark, B. H., & Montgomery, D. B. (1999). Managerial identification of competitors. *Journal of Marketing*, 63(3), 67-83.
- Cockburn, I. M., & Henderson, R. M. (1998). Absorptive capacity, coauthoring behavior, and the organization of research in drug discovery. *The Journal of Industrial Economics*, 46(2), 157-182.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* {Ind cd. Hillsdale, NJ: Erlbaum.

- Cohen, W. M., & Levinthal, D. A. (1989). Innovation and learning: the two faces of R & D. *The economic journal*, 99(397), 569-596.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 35(1), 128-152.
- Cohen, W. M., Nelson, R. R., & Walsh, J. P. (2002). Links and impacts: the influence of public research on industrial R&D. *Management science*, 48(1), 1-23.
- Cooke, P., & Leydesdorff, L. (2006). Regional development in the knowledge-based economy: The construction of advantage. *The journal of technology Transfer*, 31(1), 5-15.
- Cooper, D. R., & Schindler, P. S. (2016). *Métodos de Pesquisa em Administração-12ª Edição*. McGraw Hill Brasil.
- Cormican, K., & O'Sullivan, D. (2003). A collaborative knowledge management tool for product innovation management. *International Journal of Technology Management*.
- Crawford, C. B. (2005). Effects of transformational leadership and organizational position on knowledge management. *Journal of knowledge management*.
- Crespi, G., D'Este, P., Fontana, R., & Geuna, A. (2011). The impact of academic patenting on university research and its transfer. *Research policy*, 40(1), 55-68.
- Cricelli, L., & Grimaldi, M. (2010). Knowledge-based inter-organizational collaborations. *Journal of Knowledge Management*, 14(3), 348-358.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, 16(3), 297-334. Nunnally, J. C. (1978). *Psychometric theory* (2nd edit.). New York.
- Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of management review*, 24(3), 522-537.
- Cunéo, P., & Mairesse, J. (1984), 'Productivity and R&D at Firm Level in French Manufacturing,' in R&D, Patents and Productivity, ed. Z. Griliches, Chicago: University of Chicago Press, pp. 375- 392.
- Cyert, R. M., & March, J. G. (1963). A behavioral theory of the firm. *Englewood Cliffs, NJ*, 2(4), 169-187.
- D'este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial university and individual motivations. *The Journal of Technology Transfer*, 36(3), 316-339.
- Daghfous, A. (2004). Absorptive capacity and the implementation of knowledge-intensive best practices. *SAM Advanced Management Journal*, 69(2), 21.
- Dahlander, L., & Gann, D. M. (2010). How open is innovation?. *Research policy*, 39(6), 699-709.

- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of management journal*, 34(3), 555-590.
- Damanpour, F. (1996). Organizational complexity and innovation: developing and testing multiple contingency models. *Management science*, 42(5), 693-716.
- Damanpour, F., & Aravind, D. (2012). Managerial innovation: Conceptions, processes and antecedents. *Management and organization review*, 8(2), 423-454.
- Damanpour, F., & Evan, W. M. (1984). Organizational innovation and performance: the problem of "organizational lag". *Administrative science quarterly*, 392-409.
- Damanpour, F., Walker, R. M., & Avellaneda, C. N. (2009). Combinative effects of innovation types and organizational performance: A longitudinal study of service organizations. *Journal of management studies*, 46(4), 650-675.
- Darroch, J. (2005). Knowledge management, innovation and firm performance. *Journal of knowledge management*, 9(3), 101-115.
- Darroch, J., & McNaughton, R. (2002). Examining the link between knowledge management practices and types of innovation. *Journal of intellectual capital*.
- Darroch, J., & McNaughton, R. (2003). Beyond market orientation: knowledge management and the innovativeness of New Zealand firms. *Eur J Mark*; 37(3/4):572-93.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge: How organizations manage what they know*. Harvard Business Press.
- Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. *Psychological bulletin*, 125(6), 627.
- DeGroot, T., Kiker, D. S., & Cross, T. C. (2000). A meta-analysis to review organizational outcomes related to charismatic leadership. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 17(4), 356-372.
- Demsetz, H. (1988). The theory of the firm revisited. *Journal of Law, Economics, & Organization*, 4(1), 141-161.
- Denison, D. R. (1996). What is the difference between organizational culture and organizational climate? A native's point of view on a decade of paradigm wars. *Academy of management review*, 21(3), 619-654.
- Derehi, D. D. (2015). Innovation management in global competition and competitive advantage. *Procedia-Social and behavioral sciences*, 195, 1365-1370.
- Dess, G. G., & Robinson Jr, R. B. (1984). Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit. *Strategic management journal*, 5(3), 265-273.

- Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of marketing research*, 38(2), 269-277.
- Dias, R. T., & Bresciani, S. (2006). R&D and knowledge: a theoretical assessment of the internationalization strategies. *International Journal of Technology, Policy and Management*, 6(1), 1-32.
- Dinh, J. E., Lord, R. G., Gardner, W. L., Meuser, J. D., Liden, R. C., & Hu, J. (2014). Leadership theory and research in the new millennium: Current theoretical trends and changing perspectives. *The Leadership Quarterly*, 25(1), 36-62.
- Dodgson, M. (1991). The management of technological collaboration. *Engineering Management Journal*, 1(4), 187-191.
- Dodgson, M. (1993). Organizational learning: a review of some literatures. *Organization studies*, 14(3), 375-394.
- Donate, M. J., & de Pablo, J. D. S. (2015). The role of knowledge-oriented leadership in knowledge management practices and innovation. *Journal of Business Research*, 68(2), 360-370.
- Doyle, P., & Bridgewater, S. (1988). *Innovation in marketing*. The Chartered Institute of Marketing, Elsevier Butterworth Heinemann, Oxford.
- Drechsler, W., & Natter, M. (2012). Understanding a firm's openness decisions in innovation. *Journal of business research*, 65(3), 438-445.
- Drucker, P. (1954). *The practice of management*. New York: Harper & Row Publishers.
- Du, J., Leten, B., & Vanhaverbeke, W. (2014). Managing open innovation projects with science-based and market-based partners. *Research Policy*, 43(5), 828-840.
- Duncan, R. (1979). Organizational learning: Implications for organizational design. *Research in organizational behavior*, 1, 75-123.
- Dunning, J.H. (2000). *Regions, globalization, and the knowledge economy*. Oxford University Press.
- Durst, S., & Runar Edvardsson, I. (2012). Knowledge management in SMEs: a literature review. *Journal of Knowledge Management*, 16(6), 879-903.
- Easterby-Smith, M., & Lyles, M. A. (Eds.). (2011). *Handbook of organizational learning and knowledge management* (No. 2nd ed). Chichester: Wiley.
- Easterby-Smith, M., Lyles, M. A., & Tsang, E. W. (2008). Inter-organizational knowledge transfer: Current themes and future prospects. *Journal of management studies*, 45(4), 677-690.
- Ebersberger, B., Bloch, C., Herstad, S. J., & Van De Velde, E. L. S. (2012). Open innovation practices and their effect on innovation performance. *International Journal of Innovation and Technology Management*, 9(06), 1250040.

- Egan, T. M., Yang, B., & Bartlett, K. R. (2004). The effects of organizational learning culture and job satisfaction on motivation to transfer learning and turnover intention. *Human resource development quarterly*, 15(3), 279-301.
- Eisenhardt, K. M., & Santos, F. M. (2002). Knowledge-based view: A new theory of strategy. *Handbook of strategy and management*, 1(1), 139-164.
- Elkins, T., & Keller, R. T. (2003). Leadership in research and development organizations: A literature review and conceptual framework. *The leadership quarterly*, 14(4-5), 587-606.
- Ellinger, A. D., Ellinger, A. E., Yang, B., & Howton, S. W. (2002). The relationship between the learning organization concept and firms' financial performance: An empirical assessment. *Human resource development quarterly*, 13(1), 5-22.
- Embry, K. (2010). *A subordinate description of the experience of working with a supervisor that is using transformational leadership: A qualitative study* (Doctoral dissertation, Capella University).
- Enkel, E., Gassmann, O., & Chesbrough, H. (2009). Open R&D and open innovation: exploring the phenomenon. *R&d Management*, 39(4), 311-316.
- Ensley, M. D., Pearce, C. L., & Hmieleski, K. M. (2006). The moderating effect of environmental dynamism on the relationship between entrepreneur leadership behavior and new venture performance. *Journal of Business Venturing*, 21(2), 243-263.
- Esmailpoorarabi, N., Yigitcanlar, T., & Guaralda, M. (2016). Towards an urban quality framework: Determining critical measures for different geographical scales to attract and retain talent in cities. *International Journal of Knowledge-Based Development*, 7(3), 290-312.
- Espejo, R., & Dominici, G. (2017). Cybernetics of value cocreation for product development. *Systems Research and Behavioral Science*, 34(1), 24-40.
- Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations. *Social science information*, 42(3), 293-337.
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations. *Research policy*, 29(2), 109-123.
- Etzkowitz, H., Webster, A., Gebhardt, C., & Terra, B. R. C. (2000). The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. *Research policy*, 29(2), 313-330.
- Faems, D., Van Looy, B., & Debackere, K. (2005). Interorganizational collaboration and innovation: Toward a portfolio approach. *Journal of product innovation management*, 22(3), 238-250.
- Farris, P. W., Bendle, N. T., Pfeifer, P. E., & Reibstein, D. J. (2006). *Marketing metrics: 50+ metrics every executive should master*. Pearson Education.

- Feldman, M. P. (1994). Knowledge complementarity and innovation. *Small business economics*, 6(5), 363-372.
- Felin, T., & Hesterly, W. S. (2007). The knowledge-based view, nested heterogeneity, and new value creation: Philosophical considerations on the locus of knowledge. *Academy of management review*, 32(1), 195-218.
- Fey, C. F., Björkman, I., & Pavlovskaya, A. (2000). The effect of human resource management practices on firm performance in Russia. *International Journal of Human Resource Management*, 11(1), 1-18.
- Fichman, R. G. (2004). Real options and IT platform adoption: Implications for theory and practice. *Information systems research*, 15(2), 132-154.
- Fiol, C. M., & Lyles, M. A. (1985). Organizational learning. *Academy of management review*, 10(4), 803-813.
- Flatten, T., Adams, D., & Brettel, M. (2015). Fostering absorptive capacity through leadership: A cross-cultural analysis. *Journal of World Business*, 50(3), 519-534.
- Forida, R., & Cohen, W. (1999). Engine or infrastructure? The university role in economic development. *Industrializing knowledge: University-industry linkages in Japan and the United States*. MIT Press, Cambridge, MA.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1), 39-50.
- Fosfuri, A., & Tribó, J. A. (2008). Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega*, 36(2), 173-187.
- Foss, N. J., & Pedersen, T. (2002). Transferring knowledge in MNCs: The role of sources of subsidiary knowledge and organizational context. *Journal of International Management*, 8(1), 49-67.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, 74(1), 59-109.
- Fritsch, M., & Lukas, R. (2001). Who cooperates on R&D?. *Research policy*, 30(2), 297-312.
- Galan, J. P., & Vernet, E. (2000). Vers une 4ème génération: les études de marché «on-line». *Décisions Marketing*, 39-52.
- Galhanone, R. F. (2013). *Valor percebido pelo consumidor de produtos de luxo: proposição de um modelo teórico* (Doctoral dissertation, Universidade de São Paulo).
- Gama, F., Frishammar, J., & Parida, V. (2019). Idea generation and open innovation in SMEs: When does market-based collaboration pay off most?. *Creativity and Innovation Management*, 28(1), 113-123.
- Gans, J. S., & Stern, S. (2003). The product market and the market for "ideas": commercialization strategies for technology entrepreneurs. *Research policy*, 32(2), 333-350.

- García Martínez, M., Lazzarotti, V., Manzini, R., & Sánchez García, M. (2014). Open innovation strategies in the food and drink industry: determinants and impact on innovation performance. *International Journal of Technology Management* 23, 66(2-3), 212-242.
- García-Morales, V. J., Lloréns-Montes, F. J., & Verdú-Jover, A. J. (2008). The effects of transformational leadership on organizational performance through knowledge and innovation. *British journal of management*, 19(4), 299-319.
- Garner, C., & Ternouth, P. (2011). Absorptive capacity and innovation in the triple helix model. *International Journal of Knowledge-Based Development*, 2(4), 357-371.
- Garud, R., & Nayyar, P. R. (1994). Transformative capacity: Continual structuring by intertemporal technology transfer. *Strategic management journal*, 15(5), 365-385.
- Garwin, D. A. (1993). Building a learning organization. *Harvard business review*, 71(4), 73-91.
- Gassmann, O. (2006). Opening up the innovation process: towards an agenda. *R&D Management*, 36(3), 223-228.
- Gassmann, O., & Enkel, E. (2004). Towards a theory of open innovation: three core process archetypes.
- Gephart, M. A., & Marsick, V. J. (1996). Learning organizations come alive. *Training & Development*, 50(12), 35-45.
- Gerybadze, A., & Reger, G. (1999). Globalization of R&D: recent changes in the management of innovation in transnational corporations. *Research policy*, 28(2-3), 251-274.
- Ghasabeh, M. S., Soosay, C., & Reaiche, C. (2015). The emerging role of transformational leadership. *The Journal of Developing Areas*, 49(6), 459-467.
- Gholami, M. H., Asli, M. N., Nazari-Shirkouhi, S., & Noruzy, A. (2013). Investigating the influence of knowledge management practices on organizational performance: an empirical study. *Acta Polytechnica Hungarica*, 10(2), 205-216.
- Gil, A. C. (2008). *Métodos e técnicas de pesquisa social*. 6. ed. Editora Atlas SA.
- Giuliani, E., & Arza, V. (2009). What drives the formation of 'valuable' university-industry linkages?: Insights from the wine industry. *Research policy*, 38(6), 906-921.
- Glass, A. J., & Saggi, K. (1998). International technology transfer and the technology gap. *Journal of development economics*, 55(2), 369-398.
- Global Innovation Index (2013). *Global Innovation Index 2013: The Local Dynamics of Innovation*. Geneva, WIPO; Ithaca, NY: Cornell University; and Fontainebleau: INSEAD.
- Glynn, M. A. (1996). Innovative genius: A framework for relating individual and organizational intelligences to innovation. *Academy of management review*, 21(4), 1081-1111.

- Gnyawali, D. R., Steward A. C., Grant, J. H. (1997) Creation and utilization of organizational knowledge: an empirical study of the roles of organizational learning on strategic decision making. *Acad Manag Proc*:16–20.
- Godin, B., & Gingras, Y. (2000). The place of universities in the system of knowledge production. *Research policy*, 29(2), 273-278.
- Goh, S. C. (1998). Toward a learning organization: The strategic building blocks. *SAM Advanced Management Journal*, 63, 15-22.
- Gold, A. H., Malhotra, A., & Segars, A. H. (2001). Knowledge management: An organizational capabilities perspective. *Journal of management information systems*, 18(1), 185-214.
- Gopalakrishnan, S. (2000). Unraveling the links between dimensions of innovation and organizational performance. *The Journal of High Technology Management Research*, 11(1), 137-153.
- Gottfredson, M., Puryear, R., & Phillips, S. (2005). Strategic sourcing: from periphery to the core. *Harvard business review*, 83(2), 132-9.
- Götz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. In *Handbook of partial least squares* (pp. 691-711). Springer, Berlin, Heidelberg.
- Grant, R. M. (1996a). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization science*, 7(4), 375-387.
- Grant, R. M. (1996b). Toward a knowledge-based theory of the firm. *Strategic management journal*, 17(S2), 109-122.
- Greitzer, E. M., Pertuze, J. A., Calder, E. S., & Lucas, W. A. (2010). Best practices for industry-university collaboration. *MIT Sloan Management Review*, 51(4), 83.
- Greve, H. R. (2005). Interorganizational learning and heterogeneous social structure. *Organization Studies*, 26(7), 1025-1047.
- Griffin, A., and Page, A.L. (1996), 'PDMA Success Measurement Project: Recommended Measures for Product Development Success and Failure,' *Journal of Product Innovation Management*, 13, 478– 496.
- Griliches, Z. (1994). Explanations of productivity growth: Is the glass half empty?. *American Economic Review*, 84(1), 1-25.
- Griliches, Z., & Mairesse, J. (1998), R&D and productivity growth: comparing Japanese and US manufacturing firms. In *R&D and productivity*, ed. Z. Griliches, (pp. 187– 210). University of Chicago Press.
- Grimpe, C., & Fier, H. (2010). Informal university technology transfer: a comparison between the United States and Germany. *The Journal of Technology Transfer*, 35(6), 637-650.
- Guimón, J. (2013). Promoting university-industry collaboration in developing countries. *World Bank*, 3, 12-48.

- Gulati, R. (1999). Network location and learning: The influence of network resources and firm capabilities on alliance formation. *Strategic management journal*, 20(5), 397-420.
- Gulbrandsen, M., & Slipersaeter, S. (2007). The third mission and the entrepreneurial university model. *Universities and strategic knowledge creation*, 112-143.
- Gumusluoğlu, L., & Ilsev, A. (2009). Transformational leadership and organizational innovation: The roles of internal and external support for innovation. *Journal of Product Innovation Management*, 26(3), 264-277.
- Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2011). Effects of innovation types on firm performance. *International Journal of production economics*, 133(2), 662-676.
- Gupta, A. K., & Govindarajan, V. (2000). Knowledge flows within multinational corporations. *Strategic management journal*, 21(4), 473-496.
- Gupta, A. K., & Govindarajan, V. (2004). Global strategy and organization.
- Hagen, R. (2002). Globalization, university transformation and economic regeneration: A UK case study of public/private sector partnership. *International Journal of Public Sector Management*, 15(3), 204-218.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.
- Hair Jr, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European business review*.
- Hair, J. F., Babin, B., Money, A., & Samouel, P. (2005). *Fundamentos de métodos de pesquisa em administração*. Bookman Companhia Ed.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: Global edition*.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis (Vol. 6)*.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, 19(2), 139-152.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long range planning*, 46(1-2), 1-12.
- Hajir, J. A., Obeidat, B. Y., Al-dalahmeh, M. A., & Masa'deh, R. (2015). The role of knowledge management infrastructure in enhancing innovation at mobile telecommunication companies in Jordan. *European Journal of Social Sciences*, 50(3), 313-330.
- Hall, B. H., Link, A. N., & Scott, J. T. (2001). Barriers inhibiting industry from partnering with universities: evidence from the advanced technology program. *The Journal of Technology Transfer*, 26(1-2), 87-98.

- Hamel, G. (2006). The why, what, and how of management innovation. *Harvard business review*, 84(2), 72.
- Han, S. H., Seo, G., Yoon, S. W., & Yoon, D. Y. (2016). Transformational leadership and knowledge sharing. *Journal of Workplace Learning*.
- Hancott, D. E. (2005). *The relationship between transformational leadership and organizational performance in the largest public companies in Canada*. Capella University.
- Hannan, E. J., & Quinn, B. G. (1979). The determination of the order of an autoregression. *Journal of the Royal Statistical Society: Series B (Methodological)*, 41(2), 190-195.
- Hargadon, A., & Sutton, R. I. (1997). Technology brokering and innovation in a product development firm. *Administrative science quarterly*, 716-749.
- Hayes, B. E. (2008). *Measuring customer satisfaction and loyalty: survey design, use, and statistical analysis methods*. ASQ Quality Press.
- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial management & data systems*.
- Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, P. (2010). Metodología de la investigación.
- Hernandez, M., Eberly, M. B., Avolio, B. J., & Johnson, M. D. (2011). The loci and mechanisms of leadership: Exploring a more comprehensive view of leadership theory. *The Leadership Quarterly*, 22(6), 1165-1185.
- Hervas-Oliver, J. L., Sempere-Ripoll, F., & Boronat-Moll, C. (2014). Process innovation strategy in SMEs, organizational innovation and performance: a misleading debate?. *Small Business Economics*, 43(4), 873-886.
- Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic journal of business research methods*, 6(1), 53-60.
- Hoskisson, R. E., Wan, W. P., Yiu, D., & Hitt, M. A. (1999). Theory and research in strategic management: Swings of a pendulum. *Journal of management*, 25(3), 417-456.
- Hou, J. L., Sun, M. T., & Chuo, H. C. (2005). An intelligent knowledge management model for construction and reuse of automobile manufacturing intellectual properties. *The International Journal of Advanced Manufacturing Technology*, 26(1-2), 169-182.
- Hoveyda, R. (2007). Investigation the relationship between learning organization factors and improvement of educational quality in universities of Isfahan province. *Unpublished Ph. D. dissertation, University of Isfahan*.
- Howell, J. M., & Avolio, B. J. (1993). Transformational leadership, transactional leadership, locus of control, and support for innovation: Key predictors of consolidated-business-unit performance. *Journal of applied psychology*, 78(6), 891.

- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural equation modeling: a multidisciplinary journal*, 6(1), 1-55.
- Huang, F., & Rice, J. (2009). The role of absorptive capacity in facilitating "Open innovation" outcomes: A study of Australian SMEs in the manufacturing sector. *International Journal of Innovation Management*, 13(02), 201-220.
- Huang, K. F., & Yu, C. M. J. (2011). The effect of competitive and non-competitive R&D collaboration on firm innovation. *The Journal of Technology Transfer*, 36(4), 383-403.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization science*, 2(1), 88-115.
- Huggins, R. (2011). The growth of knowledge-intensive business services: Innovation, markets and networks. *European Planning Studies*, 19(8), 1459-1480.
- Huizingh, E. K. (2011). Open innovation: State of the art and future perspectives. *Technovation*, 31(1), 2-9.
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic management journal*, 20(2), 195-204.
- Hult, G. T. M., Ketchen Jr, D. J., & Slater, S. F. (2004). Information processing, knowledge development, and strategic supply chain performance. *Academy of management journal*, 47(2), 241-253.
- Hult, G. T. M., Ketchen, D. J., Griffith, D. A., Chabowski, B. R., Hamman, M. K., Dykes, B. J., ... & Cavusgil, S. T. (2008). An assessment of the measurement of performance in international business research. *Journal of International Business Studies*, 39(6), 1064-1080.
- Hung, R. Y. Y., Lien, B. Y. H., Yang, B., Wu, C. M., & Kuo, Y. M. (2011). Impact of TQM and organizational learning on innovation performance in the high-tech industry. *International business review*, 20(2), 213-225.
- Hurley, R. F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: an integration and empirical examination. *Journal of marketing*, 62(3), 42-54.
- Huston, L., & Sakkab, N. (2006). Connect and develop. *Harvard business review*, 84(3), 58-66.
- Hwang, J., & Lee, Y. (2010). External knowledge search, innovative performance and productivity in the Korean ICT sector. *Telecommunications Policy*, 34(10), 562-571.
- Ichijo, K., von Krogh, G., & Nonaka, I. (1998). Knowledge enablers. *Knowing in firms: Understanding, managing and measuring knowledge*, 173-203.
- Ichniowski, C., Shaw, K., & Crandall, R. W. (1995). Old dogs and new tricks: determinants of the adoption of productivity-enhancing work practices. *Brookings papers on economic activity. Microeconomics*, 1995, 1-65.

- Inauen, M., & Schenker-Wicki, A. (2011). The impact of outside-in open innovation on innovation performance. *European Journal of Innovation Management*, 14(4), 496-520.
- Inkpen, A. C., & Dinur, A. (1998). Knowledge management processes and international joint ventures. *Organization science*, 9(4), 454-468.
- James, C. R. (2003). Designing learning organization. *Organizational Dynamics*, 32(1), 46-61
- Janićijević, N. (2011). Methodological approaches in the research of organizational culture. *Economic Annals*, 56(189), 69-99.
- Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2005). Managing potential and realized absorptive capacity: how do organizational antecedents matter?. *Academy of management journal*, 48(6), 999-1015.
- Jansen, J. J., Van Den Bosch, F. A., & Volberda, H. W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management science*, 52(11), 1661-1674.
- Jansen, J. J., Vera, D., & Crossan, M. (2009). Strategic leadership for exploration and exploitation: The moderating role of environmental dynamism. *The Leadership Quarterly*, 20(1), 5-18.
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of consumer research*, 30(2), 199-218.
- Jennex, M. E. (Ed.). (2006). *Knowledge management in modern organizations*. Igi Global.
- Jiang, X., Li, M., Gao, S., Bao, Y., & Jiang, F. (2013). Managing knowledge leakage in strategic alliances: The effects of trust and formal contracts. *Industrial Marketing Management*, 42(6), 983-991.
- Jiménez-Jiménez, D., & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of business research*, 64(4), 408-417.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Scientific Software International.
- Jue, A. L. (2004). *Towards a taxonomy of spirit-centered leadership as reflected in phenomenological experiences of entrepreneurial leaders* (Doctoral dissertation, University of Phoenix).
- Jung, D. I., Chow, C., & Wu, A. (2003). The role of transformational leadership in enhancing organizational innovation: Hypotheses and some preliminary findings. *The leadership quarterly*, 14(4-5), 525-544.
- Kaplan, R. S., & Norton, D. P. (2005). The balanced scorecard: measures that drive performance. *Harvard business review*, 83(7), 172.

- Karnani, F. (2013). The university's unknown knowledge: Tacit knowledge, technology transfer and university spin-offs findings from an empirical study based on the theory of knowledge. *The Journal of Technology Transfer*, 38(3), 235-250.
- Katz, R., & Allen, T. J. (1982). Investigating the Not Invented Here (NIH) syndrome: A look at the performance, tenure, and communication patterns of 50 R & D Project Groups. *R&D Management*, 12(1), 7-20.
- Kedia, B. L., & Bhagat, R. S. (1988). Cultural constraints on transfer of technology across nations: Implications for research in international and comparative management. *Academy of Management Review*, 13(4), 559-571.
- Keskin, H. (2006). Market orientation, learning orientation, and innovation capabilities in SMEs: An extended model. *European Journal of innovation management*, 9(4), 396-417.
- Kim, S. H., & Huarng, K. H. (2011). Winning strategies for innovation and high-technology products management. *Journal of Business Research*, 64(11), 1147-1150.
- Kline, R. B. (2005). Principles and practice of structural equation modeling 2nd ed. *New York: Guilford*.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling*. Guilford publications.
- Kline, S. J., Rosenberg, N. (1986). An overview of innovation. In: Landau, R., Rosenberg, N. (Eds.), *The Positive Sum Strategy: Harnessing Technology for Economic Growth*. *National Academy Press*, Washington, pp. 275-306.
- Knudsen, M. P. (2007). The relative importance of interfirm relationships and knowledge transfer for new product development success. *Journal of Product Innovation Management*, 24(2), 117-138.
- Ko, D. G., Kirsch, L. J., & King, W. R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. *MIS quarterly*, 59-85.
- Ko, K. K., To, C. K., Zhang, Z. M., Ngai, E. W., & Chan, T. L. (2011). Analytic collaboration in virtual innovation projects. *Journal of Business Research*, 64(12), 1327-1334.
- Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science*, 3(3), 383-397.
- Kogut, B., & Zander, U. (1993). Knowledge of the firm and the evolutionary theory of the multinational corporation. *Journal of international business studies*, 24(4), 625-645.
- Lai, Y. L., Hsu, M. S., Lin, F. J., Chen, Y. M., & Lin, Y. H. (2014). The effects of industry cluster knowledge management on innovation performance. *Journal of Business Research*, 67(5), 734-739.
- Lakatos, E. M.; Marconi, M. A. (2010) *Fundamentos de Metodologia Científica*. 7. ed. São Paulo: *Atlas*.
- Lam, A. (2004). Organizational innovation.

- Lam, Y. J. (2002). Defining the effects of transformational leadership on organizational learning: A cross-cultural comparison. *School Leadership & Management*, 22(4), 439-452.
- Lane, P. J., & Lubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. *Strategic management journal*, 19(5), 461-477.
- Lane, P. J., Koka, B. R., & Pathak, S. (2006). The reification of absorptive capacity: A critical review and rejuvenation of the construct. *Academy of management review*, 31(4), 833-863
- Larédo, P., & Mustar, P. (Eds.). (2001). *Research and innovation policies in the new global economy: An international comparative analysis*. Edward Elgar Publishing.
- Laursen, K., & Salter, A. (2006). Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms. *Strategic management journal*, 27(2), 131-150.
- Law, K. S., Wong, C. S., & Mobley, W. M. (1998). Toward a taxonomy of multidimensional constructs. *Academy of management review*, 23(4), 741-755.
- Lazzarotti, V., Manzini, R., & Pellegrini, L. (2010). Open innovation models adopted in practice: an extensive study in Italy. *Measuring business excellence*, 14(4), 11-23.
- Lazzarotti, V., Manzini, R., & Pellegrini, L. (2011). Firm-specific factors and the openness degree: a survey of Italian firms. *European Journal of Innovation Management*, 14(4), 412-434.
- Lazzarotti, V., Manzini, R., Nosella, A., & Pellegrini, L. (2016). Collaborations with scientific partners: The mediating role of the social context in fostering innovation performance. *Creativity and innovation management*, 25(1), 142-156.
- Lazzeroni, M., & Piccaluga, A. (2003). Towards the entrepreneurial university. *Local Economy*, 18(1), 38-48.
- Lee, H., & Choi, B. (2003). Knowledge management enablers, processes, and organizational performance: An integrative view and empirical examination. *Journal of management information systems*, 20(1), 179-228.
- Lee, S. M., Olson, D. L., & Trimi, S. (2010). The impact of convergence on organizational innovation. *Organizational Dynamics*, 39(3), 218.
- Lee, S. M., Olson, D. L., & Trimi, S. (2012). Co-innovation: convergenomics, collaboration, and co-creation for organizational values. *Management Decision*, 50(5), 817-831.
- Leithwood, K., Leonard, L., & Sharratt, L. (1998). Conditions fostering organizational learning in schools. *Educational administration quarterly*, 34(2), 243-276.
- Levinthal, D. A. (1991). Organizational adaptation and environmental selection-interrelated processes of change. *Organization science*, 2(1), 140-145.
- Levy, D. L. (2005). Offshoring in the new global political economy. *Journal of Management Studies*, 42(3), 685-693.

- Lewin, K., Lippitt, R., & White, R. K. (1939). Patterns of aggressive behavior in experimentally created "social climates". *The Journal of social psychology, 10*(2), 269-299.
- Li, C. C. (1948). An introduction to population genetics. National Peking University Press, Peking, p. 152-176.
- Li, C. C. (1956). The concept of path coefficient and its impact on population genetics. *Biometrics, 12*(2), 190-210.
- Li, G., Shang, Y., Liu, H., & Xi, Y. (2014). Differentiated transformational leadership and knowledge sharing: A cross-level investigation. *European Management Journal, 32*(4), 554-563.
- Li, Y., Guo, H., Liu, Y., & Li, M. (2008). Incentive mechanisms, entrepreneurial orientation, and technology commercialization: Evidence from China's transitional economy. *Journal of Product Innovation Management, 25*(1), 63-78.
- Li, Y., Wei, Z., & Liu, Y. (2010). Strategic orientations, knowledge acquisition, and firm performance: the perspective of the vendor in cross-border outsourcing. *Journal of Management Studies, 47*(8), 1457-1482.
- Liao, C., Chuang, S. H., & To, P. L. (2011). How knowledge management mediates the relationship between environment and organizational structure. *Journal of business research, 64*(7), 728-736.
- Liao, S. H., & Wu, C. C. (2010). System perspective of knowledge management, organizational learning, and organizational innovation. *Expert systems with Applications, 37*(2), 1096-1103.
- Liao, S. H., Fei, W. C., & Liu, C. T. (2008). Relationships between knowledge inertia, organizational learning and organization innovation. *Technovation, 28*(4), 183-195.
- Lichtenberg, F. R., & Siegel, D. (1991). The impact of R&D investment on productivity—New evidence using linked R&D—LRD data. *Economic inquiry, 29*(2), 203-229.
- Lichtenthaler, U. (2007). The drivers of technology licensing: An industry comparison. *California management review, 49*(4), 67-89.
- Lichtenthaler, U. (2009). Absorptive capacity, environmental turbulence, and the complementarity of organizational learning processes.
- Lichtenthaler, U., & Lichtenthaler, E. (2009). A capability-based framework for open innovation: Complementing absorptive capacity. *Journal of management studies, 46*(8), 1315-1338.
- Lin, B. W., & Chen, J. S. (2005). Corporate technology portfolios and R&D performance measures: a study of technology intensive firms. *R&D Management, 35*(2), 157-170.
- Locke, E. A., & Schattke, K. (2018). Intrinsic and extrinsic motivation: Time for expansion and clarification. *Motivation Science*.

- Lofstrom, S. M. (2000). Absorptive capacity in strategic alliances: investigating the effects of individuals' social and human capital on inter-firm learning. *Management*, 30(1), 405-3522.
- Lohmöller, J. B. (2013). *Latent variable path modeling with partial least squares*. Springer Science & Business Media.
- López, S. P., Peón, J. M. M., & Ordás, C. J. V. (2004). Managing knowledge: the link between culture and organizational learning. *Journal of knowledge management*.
- Lopez, S. P., Peón, J. M. M., & Ordás, C. J. V. (2005). Organizational learning as a determining factor in business performance. *The learning organization*.
- López-Nicolás, C., & Meroño-Cerdán, Á. L. (2011). Strategic knowledge management, innovation and performance. *International journal of information management*, 31(6), 502-509.
- Lowe, K. B., Kroeck, K. G., & Sivasubramaniam, N. (1996). Effectiveness correlates of transformational and transactional leadership: A meta-analytic review of the MLQ literature. *The leadership quarterly*, 7(3), 385-425.
- Luthans, F., Youssef, C. M., & Avolio, B. J. (2015). *Psychological capital and beyond*. Oxford University Press, USA.
- Malhotra, N. K. (2006). Questionnaire design and scale development. *The handbook of marketing research: Uses, misuses, and future advances*, 83-94.
- Malhotra, N. K. (2012). *Pesquisa de marketing: uma orientação aplicada*. Bookman Editora.
- Malhotra, N., Birks, D., & Wills, P. (2012). *Marketing Research: an applied approach: 4ed*. New York: Pearson.
- March, J. G., & Sutton, R. I. (1997). Crossroads—organizational performance as a dependent variable. *Organization science*, 8(6), 698-706.
- March, J., & Simon, H. (1993) *Organizations*. Oxford: Blackwell Publishers.
- Marconi, M. D. A., & Lakatos, E. M. (2003). *Fundamentos de metodologia científica*.
- Martin, B. R., (2003). The changing social contract for science and the evolution of the university. In: Geuna, A., Salter, A.J., Steinmueller, W.E. (Eds.), *Science and Innovation Rethinking the Rationales for Public Funding*. Edward Elgar, Cheltenham, UK.
- Matusik, S. F., & Heeley, M. B. (2005). Absorptive capacity in the software industry: Identifying dimensions that affect knowledge and knowledge creation activities. *Journal of Management*, 31(4), 549-572.
- Matusik, S. F., & Hill, C. W. (1998). The utilization of contingent work, knowledge creation, and competitive advantage. *Academy of management review*, 23(4), 680-697.
- Mazzon, J. A. (1981). *Análise do programa de alimentação do trabalhador sob o conceito de marketing social*. (Doctoral dissertation, Universidade de São Paulo).

- McDonald, R. P., & Ho, M. H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological methods*, 7(1), 64.
- McDonough III, E. F. (2000). Investigation of factors contributing to the success of cross-functional teams. *Journal of Product Innovation Management: An International Publication of the Product Development & Management Association*, 17(3), 221-235.
- McGrath, R. G., MacMillan, I. C., & Venkataraman, S. (1995). Defining and developing competence: A strategic process paradigm. *Strategic management journal*, 16(4), 251-275.
- McKee, D. (1992). An organizational learning approach to product innovation. *Journal of Product Innovation Management: An International Publication Of The Product Development & Management Association*, 9(3), 232-245.
- Meyer-Krahmer, F., & Schmoch, U. (1998). Science-based technologies: university–industry interactions in four fields. *Research policy*, 27(8), 835-851.
- Miller, D., & Friesen, P. H. (1983). Strategy-making and environment: the third link. *Strategic management journal*, 4(3), 221-235.
- Mills, A. M., & Smith, T. A. (2011). Knowledge management and organizational performance: a decomposed view. *Journal of knowledge management*, 15(1), 156-171.
- Minbaeva, D. B. (2008). HRM practices affecting extrinsic and intrinsic motivation of knowledge receivers and their effect on intra-MNC knowledge transfer. *International Business Review*, 17(6), 703-713.
- Minbaeva, D., Pedersen, T., Björkman, I., Fey, C. F., & Park, H. J. (2003). MNC knowledge transfer, subsidiary absorptive capacity, and HRM. *Journal of international business studies*, 34(6), 586-599.
- Mol, M. J., & Birkinshaw, J. (2009). The sources of management innovation: When firms introduce new management practices. *Journal of business research*, 62(12), 1269-1280.
- Montes, F. J. L., Moreno, A. R., & Morales, V. G. (2005). Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: an empirical examination. *Technovation*, 25(10), 1159-1172.
- Morgan, R. E., & Berthon, P. (2008). Market orientation, generative learning, innovation strategy and business performance inter-relationships in bioscience firms. *Journal of Management Studies*, 45(8), 1329-1353.
- Motohashi, K. (2005). University–industry collaborations in Japan: The role of new technology-based firms in transforming the National Innovation System. *Research policy*, 34(5), 583-594.
- Mowery, D. C., Nelson, R. R., Sampat, B. N., & Ziedonis, A. A. (2015). *Ivory tower and industrial innovation: University-industry technology transfer before and after the Bayh-Dole Act*. Stanford University Press.
- Mowery, D. C., Oxley, J. E., & Silverman, B. S. (1996). Strategic alliances and interfirm knowledge transfer. *Strategic management journal*, 17(S2), 77-91.

- Mudambi, R., Mudambi, S. M., & Navarra, P. (2003). How to Motivate Knowledge Workers: An Empirical Investigation of Motivation Crowding Theory. *Temple University, The Fox School of Business and Management, Discussion Paper 716*, 3.
- Mulaik, S. A., James, L. R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C. D. (1989). Evaluation of goodness-of-fit indices for structural equation models. *Psychological bulletin*, 105(3), 430.
- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 23(2), 242-266.
- Nam Nguyen, H., & Mohamed, S. (2011). Leadership behaviors, organizational culture and knowledge management practices: An empirical investigation. *Journal of Management Development*, 30(2), 206-221.
- Nam, S. (2007). *How innovation willingness influences the public organizational performance relationship: developments in how stakeholders (external organizational factors) and internal management affect performance* (Doctoral dissertation, Rutgers University).
- Neefe, D. O. (2001). Comparing levels of organizational learning maturity of colleges and universities participating in traditional and non-traditional (Academic quality improvement project) accreditation processes.
- Nelson, R. R., & Winter, S. G. (1982). The Schumpeterian tradeoff revisited. *The American Economic Review*, 72(1), 114-132.
- Nemanich, L., Banks, M., & Vera, D. (2009). Enhancing knowledge transfer in classroom versus online settings: The interplay among instructor, student, content, and context. *Decision Sciences Journal of Innovative Education*, 7(1), 123-148.
- Nevis, E. C., DiBella, A. J., & Gould, J. M. (1997). Understanding organizations as learning systems.
- Nevis, E. C., DiBella, A. J., & Gould, J. M. (1997). Understanding organizations as learning systems.
- Newey, L. R., & Zahra, S. A. (2009). The evolving firm: how dynamic and operating capabilities interact to enable entrepreneurship. *British Journal of Management*, 20, S81-S100.
- Nickerson, J. A., & Zenger, T. R. (2004). A knowledge-based theory of the firm—The problem-solving perspective. *Organization science*, 15(6), 617-632.
- Nieto, M. J., & Santamaría, L. (2007). The importance of diverse collaborative networks for the novelty of product innovation. *Technovation*, 27(6-7), 367-377.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization science*, 5(1), 14-37.
- Nonaka, I., & Takeuchi, H. (1995a). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford university press.

- Nonaka, I., & Takeuchi, H. (1995b). *The Knowledge Creating*. New York, 304.
- Norman, P. M. (2004). Knowledge acquisition, knowledge loss, and satisfaction in high technology alliances. *Journal of Business Research*, 57(6), 610-619.
- Noruzy, A., Dalfard, V. M., Azhdari, B., Nazari-Shirkouhi, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms. *The International Journal of Advanced Manufacturing Technology*, 64(5-8), 1073-1085.
- O'Cass, A., & Viet Ngo, L. (2007). Market orientation versus innovative culture: two routes to superior brand performance. *European Journal of Marketing*, 41(7/8), 868-887.
- OECD (2005), *The Measurement of Scientific and Technological Activities: Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd ed., OECD EUROSTAT, Paris
- Oliver, A. L. (2004). On the duality of competition and collaboration: network-based knowledge relations in the biotechnology industry. *Scandinavian Journal of Management*, 20(1-2), 151-171.
- Osong, E. M. (2006). *Trust as mediator of the relationship of transformational leadership on knowledge creation in law enforcement*. ProQuest.
- Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge transfer, and organizational forms. *Organization science*, 11(5), 538-550.
- Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge transfer, and organizational forms. *Organization science*, 11(5), 538-550.
- Osterloh, M., Frost, J., & Frey, B. S. (2002). The dynamics of motivation in new organizational forms. *International Journal of the Economics of Business*, 9(1), 61-77.
- Pancholi, S., Yigitcanlar, T., & Guaralda, M. (2014). Urban knowledge and innovation spaces: concepts, conditions and contexts. *Asia Pacific Journal of Innovation and Entrepreneurship*, 8(1), 15-38.
- Parida, V., Westerberg, M., & Frishammar, J. (2012). Inbound open innovation activities in high-tech SMEs: the impact on innovation performance. *Journal of small business management*, 50(2), 283-309.
- Park, B. J. R., Srivastava, M. K., & Gnyawali, D. R. (2014). Walking the tight rope of coopeition: Impact of competition and cooperation intensities and balance on firm innovation performance. *Industrial Marketing Management*, 43(2), 210-221.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods*. SAGE Publications, inc.
- Perkmann, M., & Walsh, K. (2007). University–industry relationships and open innovation: Towards a research agenda. *International Journal of Management Reviews*, 9(4), 259-280.

- Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Broström, A., D'Este, P., ... & Krabel, S. (2013). Academic engagement and commercialization: A review of the literature on university–industry relations. *Research policy*, 42(2), 423-442.
- Philbin, S. (2008). Process model for university–industry research collaboration. *European Journal of Innovation Management*, 11(4), 488-521.
- Phillips, F., & Eto, M. (1998). *Special section revitalizing university research and its contribution to society*. *Technological Forecasting and Social Change*, 57(3), 205-265.
- Pil, F. K., & MacDuffie, J. P. (1996). The adoption of high-involvement work practices. *Industrial Relations: A journal of economy and society*, 35(3), 423-455.
- Pintrich, P. R. (2003). Motivation and classroom learning. *Handbook of psychology*, 103-122.
- Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust, and organizational citizenship behaviors. *Journal of management*, 22(2), 259-298.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *The leadership quarterly*, 1(2), 107-142.
- Polanyi, M. (2009). *The tacit dimension*. University of Chicago press.
- Politis, J. D. (2001). The relationship of various leadership styles to knowledge management. *Leadership and Organization Development Journal*, 22(8), 354-364.
- Politis, J. D. (2002). Transformational and transactional leadership enabling (disabling) knowledge acquisition of self-managed teams: the consequences for performance. *Leadership & Organization Development Journal*.
- Ponds, R., Oort, F. V., & Frenken, K. (2009). Innovation, spillovers and university–industry collaboration: an extended knowledge production function approach. *Journal of Economic Geography*, 10(2), 231-255.
- Porter, M. (1980). *Competitive Strategy*, New York: Free Press. *PorterCompetitive Strategy1980*.
- Powell, T. C. (1992). Organizational alignment as competitive advantage. *Strategic management journal*, 13(2), 119-134.
- Prahalad, C. K., & Ramaswamy, V. (2004). *The future of competition: Co-creating unique value with customers*. Harvard Business Press.
- Prajogo, D. I., & Ahmed, P. K. (2006). Relationships between innovation stimulus, innovation capacity, and innovation performance. *R&D Management*, 36(5), 499-515.
- Quinn, R. E., & Rohrbaugh, J. (1981). A competing values approach to organizational effectiveness. *Public productivity review*, 122-140.

- Quintana-Garcia, C., & Benavides-Velasco, C. A. (2004). Cooperation, competition, and innovative capability: a panel data of European dedicated biotechnology firms. *Technovation*, 24(12), 927-938.
- Rainey, H. G. (2014). *Understanding and managing public organizations*. San Francisco, CA: Jossey-Bass.
- Rapini, M. S. (2007). Interação universidade-empresa no Brasil: evidências do Diretório dos Grupos de Pesquisa do CNPq. *Estudos Econômicos (São Paulo)*, 37(1), 211-233.
- Reed, R., Storrud-Barnes, S., & Jessup, L. (2012). How open innovation affects the drivers of competitive advantage: Trading the benefits of IP creation and ownership for free invention. *Management Decision*, 50(1), 58-73.
- Reis, E., Melo, P., Andrade, R., & Calapez, T. (1997). Estatística aplicada, Vol. II. *Edições Sílabo, Lisboa*.
- Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of management*, 35(3), 718-804.
- Rigby, D., & Zook, C. (2002). Open-market innovation. *Harvard business review*, 80(10), 80-93.
- Ringle, C. M., Sarstedt, M., & Zimmermann, L. (2011). Customer satisfaction with commercial airlines: The role of perceived safety and purpose of travel. *Journal of Marketing Theory and Practice*, 19(4), 459-472.
- Robins, J., & Wiersema, M. F. (1995). A resource-based approach to the multibusiness firm: Empirical analysis of portfolio interrelationships and corporate financial performance. *Strategic management journal*, 16(4), 277-299.
- Rossi, F. (2010). The governance of university-industry knowledge transfer. *European Journal of Innovation Management*, 13(2), 155-171.
- Roth, S., Himbert, L., & Zielke, S. (2017). Does unit pricing influence store price image dimensions and shopping intentions for retail stores?. *European Journal of Marketing*, 51(7/8), 1396-1413.
- Rothaermel, F. T., & Deeds, D. L. (2004). Exploration and exploitation alliances in biotechnology: A system of new product development. *Strategic management journal*, 25(3), 201-221.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, 25(1), 54-67.
- Sarstedt, M., & Schloderer, M. P. (2010). Developing a measurement approach for reputation of non-profit organizations. *International Journal of Nonprofit and Voluntary Sector Marketing*, 15(3), 276-299.

- Schartinger, D., Rammer, C., & Fröhlich, J. (2006). Knowledge interactions between universities and industry in Austria: sectorial patterns and determinants. In *Innovation, networks, and knowledge spillovers* (pp. 135-166). Springer, Berlin, Heidelberg.
- Schein, E. H. (1983). The role of the founder in creating organizational culture. *Organizational dynamics*, 12(1), 13-28.
- Scherer, F. M. (1993). Lagging productivity growth: Measurement, technology, and shock effects. *Empirica*, 20(1), 5-24.
- Schiller, D., & Liefner, I. (2007). Higher education funding reform and university–industry links in developing countries: The case of Thailand. *Higher Education*, 54(4), 543-556.
- Schilling, M. A. (1998). Technological lockout: An integrative model of the economic and strategic factors driving technology success and failure. *Academy of management review*, 23(2), 267-284.
- Schneider, B., Ehrhart, M. G., & Macey, W. H. (2013). Organizational climate and culture. *Annual review of psychology*, 64, 361-388.
- Schön, D. A., & Argyris, C. (1996). Organizational learning II: Theory, method and practice. Reading: Addison Wesley, 305(2).
- Schonlau, M., Fricker, R. D., & Elliott, M. N. (2001). Conducting research surveys via e-mail and the web. Santa Monica.
- Schrader, A. (1978) *Introdução à Pesquisa Social Empírica*, 2ª ed. Porto Alegre: Globo.
- Schroeder, L. D., Sjoquist, D. L., & Stephan, P. E. (2016). *Understanding regression analysis: An introductory guide* (Vol. 57). Sage Publications.
- Schumpeter, J. (1934). *The theory of economic development*. Cambridge: Harvard University Press.
- Schumpeter, J. (1942). *Capitalism, Socialism and Democracy*, Allen & Unwin, London.
- Schwarz, G. (1978). Estimating the dimension of a model. *The annals of statistics*, 6(2), 461-464.
- Seaver, D. S. (2010). *Effect of transformational leadership in a cross-cultural organization: A case study*. Capella University.
- Segatto-Mendes, A. P., & Sbragia, R. (2002). O processo de cooperação universidade-empresa em universidades brasileiras. *Revista de Administração da Universidade de São Paulo*, 37(4).
- Sekaran, U. (1984). *Research methods for managers: a skill-building approach*.
- Senge, P. M. (1990). *The Fifth Discipline*. Doubleday Publ, New York.

- Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G., Smith, B., & Guman, E. C. (1999). The dance of change: The challenges to sustaining momentum in learning organizations. *Performance Improvement*, 38(5), 55-58.
- Senge, P., Kliener, A., Roberts, C., Ross, R., & Smith, B. (1994). *The Fifth Discipline Field book* NewYork: Doubleday Durrency.
- Shafique, I., & Kalyar, M. N. (2018). Linking transformational leadership, absorptive capacity, and corporate entrepreneurship. *Administrative Sciences*, 8(2), 9.
- Shu, C., Page, A. L., Gao, S., & Jiang, X. (2012). Managerial ties and firm innovation: is knowledge creation a missing link?. *Journal of Product Innovation Management*, 29(1), 125-143.
- Siegel, D. S., Waldman, D., & Link, A. (2003). Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: an exploratory study. *Research policy*, 32(1), 27-48.
- Simao, L., & Franco, M. (2018). External knowledge sources as antecedents of organizational innovation in firm workplaces: a knowledge-based perspective. *Journal of Knowledge Management*, 22(2), 237-256.
- Singh, S., Darwish, T. K., & Potočnik, K. (2016). Measuring organizational performance: A case for subjective measures. *British Journal of Management*, 27(1), 214-224.
- Škerlavaj, M., Song, J. H., & Lee, Y. (2010). Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert systems with applications*, 37(9), 6390-6403.
- Smith, K. G., Collins, C. J., & Clark, K. D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms. *Academy of management Journal*, 48(2), 346-357.
- Snell, R. S. (2001). Moral foundations of the learning organization. *Human Relations*, 54(3), 319-342.
- Solís, M., & Mora-Esquivel, R. (2019). Development and validation of a measurement scale of the innovative culture in work teams. *International Journal of Innovation Science*, 11(2), 299-322.
- Soto-Acosta, P., Colomo-Palacios, R., & Popa, S. (2014). Web knowledge sharing and its effect on innovation: an empirical investigation in SMEs. *Knowledge Management Research & Practice*, 12(1), 103-113.
- Spender, J. C. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic management journal*, 17(S2), 45-62.
- Stata, R. (1989). Organizational learning-the key to management innovation. *MIT Sloan Management Review*, 30(3), 63.

- Subramaniam, M., & Venkatraman, N. (2001). Determinants of transnational new product development capability: Testing the influence of transferring and deploying tacit overseas knowledge. *Strategic management journal*, 22(4), 359-378.
- Subramaniam, M., & Youndt, M. A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management journal*, 48(3), 450-463.
- Sutz, J. (2000). The university–industry–government relations in Latin America. *Research policy*, 29(2), 279-290.
- Szafir-Goldstein, C., & Toledo, G. L. (2000). O conceito de valor percebido: um estudo de caso na indústria de papel e celulose sobre a utilização da percepção dos clientes sobre o produto.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal*, 17(S2), 27-43.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic management journal*, 17(S2), 27-43.
- Szulanski, G. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational behavior and human decision processes*, 82(1), 9-27.
- Tajasom, A., Hung, D. K. M., Nikbin, D., & Hyun, S. S. (2015). The role of transformational leadership in innovation performance of Malaysian SMEs. *Asian Journal of Technology Innovation*, 23(2), 172-188.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal*, 28(13), 1319-1350.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal*, 18(7), 509-533.
- Teigland, R., & Wasko, M. (2009). Knowledge transfer in MNCs: Examining how intrinsic motivations and knowledge sourcing impact individual centrality and performance. *Journal of International management*, 15(1), 15-31.
- Templeton, G. F., Lewis, B. R., & Snyder, C. A. (2002). Development of a measure for the organizational learning construct. *Journal of management information systems*, 19(2), 175-218.
- Tether, B. S., & Tajar, A. (2008). Beyond industry–university links: Sourcing knowledge for innovation from consultants, private research organizations and the public science-base. *Research Policy*, 37(6-7), 1079-1095.
- Tho, N. D. (2017). Knowledge transfer from business schools to business organizations: the roles absorptive capacity, learning motivation, acquired knowledge and job autonomy. *Journal of Knowledge Management*.
- Tho, N. D., & Trang, N. T. M. (2015). Can knowledge be transferred from business schools to business organizations through in-service training students? SEM and fsQCA findings. *Journal of Business Research*, 68(6), 1332-1340.

- Thomas, R. (2012). Business elites, universities and knowledge transfer in tourism. *Tourism Management*, 33(3), 553-561.
- Thornhill, S. (2006). Knowledge, innovation and firm performance in high-and low-technology regimes. *Journal of business venturing*, 21(5), 687-703.
- Thrassou, A., & Vrontis, D. (2008). Internet marketing by SMEs: towards enhanced competitiveness and internationalization of professional services. *International Journal of Internet Marketing and Advertising*, 4(2-3), 241-261.
- Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: is organizational learning a missing link?. *Strategic management journal*, 24(8), 745-761.
- Todorova, G., & Durisin, B. (2007). Absorptive capacity: Valuing a reconceptualization. *Academy of management review*, 32(3), 774-786.
- Tornatzky, L. G., Waugaman, P. G., & Gray, D. O. (2002). *Innovation U.: New university roles in a knowledge economy*. Research Triangle Park, NC: Southern Technology Council.
- Tsai, K. H., & Wang, J. C. (2004). The R&D performance in Taiwan's electronics industry: a longitudinal examination. *R&D Management*, 34(2), 179-189.
- Tsai, W. (2002). Social structure of "coopetition" within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization science*, 13(2), 179-190.
- Tsai, W., Su, K. H., & Chen, M. J. (2011). Seeing through the eyes of a rival: Competitor acumen based on rival-centric perceptions. *Academy of Management Journal*, 54(4), 761-778.
- Uddin, M. A., Fan, L., & Das, A. K. (2017). A study of the impact of transformational leadership, organizational learning, and knowledge management on organizational innovation. *Management Dynamics*, 16(2), 42-54.
- Ussahawanitchakit, P. (2008). Impacts of organizational learning on innovation orientation and firm efficiency: an empirical assessment of accounting firms in Thailand. *International Journal of Business Research*, 8(4), 1-12.
- Užienė, L. (2015). Open innovation, knowledge flows and intellectual capital. *Procedia-Social and Behavioral Sciences*, 213, 1057-1062.
- Van Den Bosch, F. A., Volberda, H. W., & De Boer, M. (1999). Coevolution of firm absorptive capacity and knowledge environment: Organizational forms and combinative capabilities. *Organization science*, 10(5), 551-568.
- Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of management review*, 11(4), 801-814.
- Vera, D., & Crossan, M. (2004). Strategic leadership and organizational learning. *Academy of management review*, 29(2), 222-240.
- Vergara, S. C. (1998) Projeto e relatórios de pesquisa em administração, 2ª ed., São Paulo: Atlas

- Veugelers, R., & Cassiman, B. (2005). R&D cooperation between firms and universities. Some empirical evidence from Belgian manufacturing. *International Journal of Industrial Organization*, 23(5-6), 355-379.
- Vincent, C. (2006). *Leadership in a knowledge society: An examination of the relationship between perceptions of leadership and knowledge management actions using a social action theory approach*. The George Washington University.
- Volberda, H. W., Van Den Bosch, F. A., & Mihalache, O. R. (2014). Advancing management innovation: Synthesizing processes, levels of analysis, and change agents. *Organization Studies*, 35(9), 1245-1264.
- Von Hippel, E. (1988). *The sources of innovation*. New York, USA: Oxford University Press.
- Wacker, J. G. (2004). A theory of formal conceptual definitions: developing theory-building measurement instruments. *Journal of Operations Management*, 22(6), 629-650.
- Wagner, S. M. (2012). Partners for business-to-business service innovation. *IEEE Transactions on Engineering Management*, 60(1), 113-123.
- Wakelin, K. (2001). Productivity growth and R&D expenditure in UK manufacturing firms. *Research policy*, 30(7), 1079-1090.
- Waldman, D. A., Ramirez, G. G., House, R. J., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of management journal*, 44(1), 134-143.
- Walker, R. M. (2004). Innovation and organizational performance: Evidence and a research agenda. *Advanced Institute of Management Research Paper*, (002).
- Walley, K. (2007). Coopetition: an introduction to the subject and an agenda for research. *International Studies of Management & Organization*, 37(2), 11-31.
- Weerawardena, J., O'Cass, A., & Julian, C. (2006). Does industry matter? Examining the role of industry structure and organizational learning in innovation and brand performance. *Journal of business research*, 59(1), 37-45.
- Wennberg, K., Wiklund, J., & Wright, M. (2011). The effectiveness of university knowledge spillovers: Performance differences between university spinoffs and corporate spinoffs. *Research Policy*, 40(8), 1128-1143.
- Werts, C. E., Linn, R. L., & Jöreskog, K. G. (1974). Intraclass reliability estimates: Testing structural assumptions. *Educational and Psychological measurement*, 34(1), 25-33.
- West, J., Salter, A., Vanhaverbeke, W., & Chesbrough, H. (2014). Open innovation: The next decade.
- Willcoxson, L. (2001). Strategies for changing a university into a learning organization. *Flexible learning for a flexible society*, 720-731.
- Wilson, C. L., Huang, J. L., & Kraiger, K. (2013). Personality and the analysis, design, and delivery of training. In *Handbook of personality at work* (pp. 581-602). Routledge.

- Wilson, K. L., Lizzio, A., & Ramsden, P. (1997). The development, validation and application of the Course Experience Questionnaire. *Studies in higher education*, 22(1), 33-53.
- Wixom, B. H., & Watson, H. J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS quarterly*, 17-41.
- Woodman, R. W., Sawyer, J. E., & Griffin, R. W. (1993). Toward a theory of organizational creativity. *Academy of management review*, 18(2), 293-321.
- Woodworth, R. S. (1918). *Dynamic psychology*. New York, NY: Columbia University Press.
- Wright, M., Clarysse, B., Lockett, A., & Knockaert, M. (2008). Mid-range universities' linkages with industry: Knowledge types and the role of intermediaries. *Research policy*, 37(8), 1205-1223.
- Wright, S. (1921). Correlation and causation. *J. agric. Res.*, 20, 557-580.
- Wright, S. (1923). The theory of path coefficients a reply to Niles's criticism. *genetics*, 8(3), 239.
- Yami, S., Castaldo, S., Dagnino, G. B., & Le Roy, F. (2010). Editors' introduction. In S. Yami, S. Castaldo, G. B. Dagnino, & F. Le Roy (Eds.), *Coopetition: Winning Strategies for the 21st century* (pp. 1-16). Northampton, MA: Edward Elgar.
- Yeh, Y. J., Lai, S. Q., & Ho, C. T. (2006). Knowledge management enablers: a case study. *Industrial Management & Data Systems*, 106(6), 793-810.
- Yigitcanlar, T. (2016). Innovate or perish—the new motto of the global knowledge economy era.
- Yu, C. L., Wang, F., & Brouthers, K. D. (2015). Domestic and foreign competitor identification and firm performance. *European Journal of International Management*, 9(4), 463-483.
- Yu, C. L., Wang, F., & Brouthers, K. D. (2016). Competitor identification, perceived environmental uncertainty, and firm performance. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 33(1), 21-35.
- Yu, T., & Cannella Jr, A. A. (2007). Rivalry between multinational enterprises: An event history approach. *Academy of Management Journal*, 50(3), 665-686.
- Yukl, G. (2002) *Leadership in organizations*, 5th edn. Prentice-Hall, New York
- Zack, M. H. (1999). Managing codified knowledge. *Sloan management review*, 40(4), 45-58.
- Zack, M., McKeen, J., & Singh, S. (2009). Knowledge management and organizational performance: an exploratory analysis. *Journal of knowledge management*, 13(6), 392-409.
- Zagoršek, H., Dimovski, V., & Škerlavaj, M. (2009). Transactional and transformational leadership impacts on organizational learning. *Journal for East European Management Studies*, 144-165.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of management review*, 27(2), 185-203.

- Zahra, S. A., Filatotchev, I., & Wright, M. (2009). How do threshold firms sustain corporate entrepreneurship? The role of boards and absorptive capacity. *Journal of business venturing*, 24(3), 248-260.
- Zaltman, G., Duncan, R., & Holbeck, J. (1973). *Innovations and Organizations*, John Wiley and Sons. Inc., New York.
- Zheng, S., Zhang, W., & Du, J. (2011). Knowledge-based dynamic capabilities and innovation in networked environments. *Journal of Knowledge Management*, 15(6), 1035-1051.
- Zheng, W., Yang, B., & McLean, G. N. (2010). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. *Journal of Business research*, 63(7), 763-771.
- Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization science*, 13(3), 339-351.

APPENDIX**Research on Innovation and the Collaborative Process between Companies and Universities**

Dear,

This is a PhD research that aims to understand if the collaborative process of knowledge exchange between Company and University positively affects innovation performance.

When we talk about Universities, we are referring not only to University-Industry Collaboration (UIC), but also to other knowledge transfer centers / facilitators who are involved with Universities, for example, ICTs (Science and Technology Institutions), TTOs (Technology Transfer Offices), Funding agency, etc.

All information collected in this survey is strictly confidential. Above all, the aggregate data and not particular aspects of each company / respondent are of interest.

Before each of the blocks you will find an indication of how to answer the questions. It will be all simple and straightforward. The time to fill is approximately 10 minutes.

You can answer the questionnaire at once, or according to your time availability. Just access the quiz from the same device (phone, tablet, notebook, or desktop) that you can navigate to previous or later pages where you left off. However, to save your answers, click at the bottom of each page under "Save and / or go to next page".

You have to save each page until you complete the quiz.

If you have any questions, please contact us at the following emails.

We count on your cooperation!

Sincerely,

Sandra Saraceni
PhD student FEA-USP
Email: saraceni_sandra@usp.br

Prof. Dr. Jose Afonso Mazzon
Advisor
Email: jamazzon@usp.br

Research on Innovation and the Collaborative Process between Companies and Universities

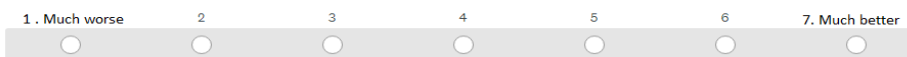
Performance against major competitors

Answer, on a scale from 1 (Much worse) to 7 (Much better), how do you perceive your company's performance against key competitors.

The farther left, the more you consider your company to perform "much worse" than its main competitors; and the farther to the right, the more you consider it to have a "much better" performance.

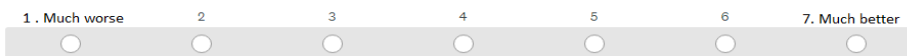
49 - Return on sales relative to the main competitors.

1 . Much worse 2 3 4 5 6 7. Much better



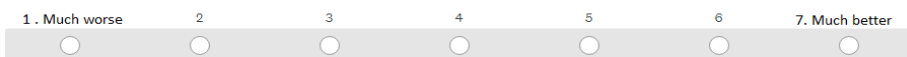
50 - The percentage of sales generated by new products / services relative to the main competitors.

1 . Much worse 2 3 4 5 6 7. Much better



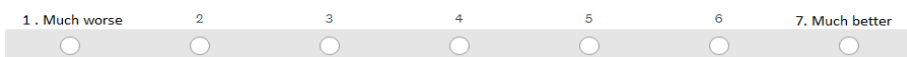
51 - The growth of market share in relation to the main competitors.

1 . Much worse 2 3 4 5 6 7. Much better



52 - Return on investments relative to the main competitors.

1 . Much worse 2 3 4 5 6 7. Much better



53 - Revenue growth in relation to the main competitors.

1 . Much worse 2 3 4 5 6 7. Much better



54 - Return on assets relative to competitors.

1. Much worse 2 3 4 5 6 7. Much better

55 - Overall performance against major competitors.

1. Much worse 2 3 4 5 6 7. Much better

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Company Information

Please kindly answer the questions below as the most appropriate option for the company you work for.

All responses will be analyzed on a consolidated basis without any company identification.

The company you work for is:

- Public
- Private

What type of capital?

- Open capital
- Closed capital

Approximately what is your company's annual gross revenue?

What percentage (%), on average, does your company export?

In terms of competitiveness in the industry, how do you rate your company?

- Nothing competitive
- Little competitive
- Competitive average
- Very competitive
- Extremely competitive

Regarding innovation, how do you rate your company?

- Nothing innovative
- Little innovative
- Innovative average
- Very innovative
- Extremely innovative

Does your company maintain a collaborative knowledge exchange process with any University or other knowledge transfer center / facilitating agents that are involved with Universities, for example, ICTs (Science and Technology Institutions), TTOs (Technology Transfer Offices), Funding agency, etc.?

- University
- ICTs (Science and Technology Institutions)
- Technology Transfer Offices (TTOs)
- Funding agency
- Other (specify)

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Respondent Data

We now ask that you answer the questions below by indicating the option that best fits your profile.

We emphasize that all responses will be analyzed in a consolidated manner without any identification of the respondent.

What is your age group?

- Under 30 years
- 30 to 39 years old
- 40 to 49 years old
- 50 to 59 years old
- 60 years or older

What is your gender?

- Feminine
- Male
- Other

What is your highest level of education?

- High school
- Undergraduate
- Lato Sensu Postgraduate / Specialization (MBA)
- Stricto Sensu Postgraduate (Master and Doctorate)

[IF YOU HAVE TOP COURSE]:

What are the higher education (s) you have taken / are taking?

- Administration
- Economy
- Engineering
- Biology
- Chemistry
- Computing / Information Systems
- Pharmacy
- Medicine
- Other [specify]

[IF YOU HAVE GRADUATE COURSE]:

What postgraduate course (s) did you take / are taking?

What is your hierarchical position in relation to the CEO of your company?

- 1st hierarchical level below
- 2nd hierarchical level below
- 3rd hierarchical level below
- 4th hierarchical level or below

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What is the name of your area / department?

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Would you like to receive the results of this survey by email?

- Yes
- No

[YES ANSWERED TO PREVIOUS QUESTION]:

Leave your email:

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and Universities**

Thanks for taking the survey.