

THE RELATIONSHIP BETWEEN ORGANIZATIONAL INNOVATIONS, INTERNAL SOURCES OF KNOWLEDGE AND ORGANIZATIONAL PERFORMANCE

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ABSTRACT

Management research considers knowledge as one of the first sources of competitiveness of the company. This observation is at the origin of development in recent years, the Knowledge-Based View (Grant, 1996), resulting from the resource-based perspective approach.

This research examines the importance of internal sources of knowledge and its relationship with organizational innovation and organizational performance. We did this research on a sample of 200 Tunisian companies operating in different sectors. Our study was built mainly on the basis of quantitative method. The data collection method is the questionnaire as part of a hypothetical-deductive approach and the mode of administration is self-administered survey and e-mail survey. The empirical verification of the assumptions of this research has led us to confirm the relationship between internal and external sources of knowledge with organizational innovation and organizational performance and to infirm the relationship between organizational innovation and organizational performance.

KEYWORDS

Organizational innovation, internal sources of knowledge, organizational performance.

1. INTRODUCTION

Many international studies underline that innovation in the organization of companies, knowledge management, and implication of the workers often make a decisive comparative advantage (Gerard and Vendramin; 2006).

The organizational innovations are considered as a key of success in the development of new products, new services and more successful processes.

Internal knowledge is defined as "the body of knowledge that the company creates within its borders. This definition includes explicit and tacit knowledge and organizational learning stored in the organizational routines, culture and strategy "(Crossan et al 1999; Nonaka 1994). In short, internal knowledge includes "the knowledge within the firm, codified as patents, trademarks and copyrights, as well as the tacit knowledge of the business such as routines and culture."Regarding the relationship between organizational innovation and organizational performance, the results of

this research are often mixed. They vary between a positive and negative relationship (Legge 1995; Montgosay and Lieberman 1998).

In addition, the concept of performance is still poorly defined, vocabulary specialists is no unanimous. Indeed, many researchers find it difficult to agree on its meaning. It is apparent, moreover, with several neighboring concepts such as efficiency and effectiveness. It remains that performance remains a medium that is often defined by criteria such as represented by the theorists and practitioners of the performance and its measurement built (Igalens et al 2003; Wu 2006).

This aims to explain the relationship between the three variables; internal sources of knowledge, organizational innovation and organizational performance and to test a model which includes the relationship in Tunisian firms. We did this research on a sample of 200 Tunisian companies operating in different sectors. Our study was built mainly on the basis of a quantitative method. The paper opted for an exploratory study using the software SPSS and AMOS. The empirical verification of the assumptions of this research has led us to confirm the relationship between the internal sources of knowledge, organizational innovation and organizational performance.

2. REVIEW OF LITERATURE

2.1. Internal sources of management

Internal knowledge is one of the sources of knowledge management that have been enjoyed in the literature (Ahuja and Lampert 2001; Katila 2002; Phene et al 2006; Rosenkopf and Nerkar 2001; Nonaka and Martinet 2003)).

Nonaka and Takeuchi (1997) challenge especially theorists of organizational learning, based on the work of (Argyris and Schon 1978) show that companies can manage themselves a "single-loop learning" but that "the learning loop double "requires outside intervention. According to them, knowledge creating company is also able to change the basic rules of interaction between tacit and explicit knowledge.

Internal knowledge contains capacities and rules which cannot be expressed. It is generated by the learning process through practice and use and defined as "the body of knowledge that the company creates within its borders. This definition incorporates explicit and tacit knowledge as well as organizational learning stored in the routines of the organization, culture and strategy "(Crossan et al 1999; Nonaka 1994). In short, internal knowledge includes "the knowledge within the firm, codified by patents, trademarks and copyrights, as well as the tacit knowledge of the business such as the routines and culture".

2.2. Organizational innovation

Many researchers are interested in the study of organizational innovation (Dozi 1988; Teece, 1989; Utterback and Abernathy 1975; Dewar et Dutton 1986; Ettlie, Bridges et O'Keffe 1984; Freeman 1992; Zaltman Duncan & Holbek 1973; Oslo Manual of the OECD 2005).

The organizational innovation is the introduction of new organizational business management methods in the workplace and / or the relationship between a company and external agents (Hamel 2006 2007 2009). According to (Gunday et al 2011), the organizational innovations are strongly linked with all administrative efforts to renew organizational routines, procedures, mechanisms, systems, etc.. and in order to renew teamwork, sharing of information, coordination, collaboration, learning and innovation. The organizational innovation is considered a source of sustainable competitive advantage (Mol et Birkinshaw 2009). Also, the organizational innovations

are strongly associated with all administrative efforts to renew organizational routines, procedures, mechanisms, systems, etc. and in order to promote teamwork, sharing of information, coordination, collaboration, learning and innovation (Gunday 2011). As regarded by a growing body of researchers innovation is a catalyst of growth in business and economy. Luecke & Katz (2003, p.2) refers to innovation as 'the introduction of a new thing or method. Innovativeness refers to 'a firm's capacity to engage in new enterprise that is, introduction of new processes, products, or ideas in the organization' (2004, p. 429). This capacity to innovate is among the most important factors which influences the business performance and as such, innovativeness is amongst the unique culture which embeds in the tangible and intangible resources leading a firm towards successful business performance.

2.3. Organizational performance

The performance is far from being a simple phenomenon; it is a complex and multidimensional concept (Cameron 1986; Chakravarthy 1986; Venkatraman et Ramanujam 1986). Cameron (1986) states that organizational performance is inherently paradoxical because, from a given perspective, it may indicate a good performance, whereas from another perspective, it might indicate otherwise. In addition, individuals may have preferences on the most relevant aspects to define and evaluate performance (Zammuto, 1984) and, consequently, they may disagree on the measures to be used, the level of importance of assigned indicators, and how to interpret the results.

Organizational performance is "the capacity of an organization to identify and implement the appropriate strategies in the context of the objectives it pursues." (Bouquin 1997).

The factors of organizational efficiency are:

- The respect for the structure published by the direction of the company.
- The relations between the services: the concern of management is to reduce or resolve conflicts that may occur between the services and can challenge the necessary coordination efficiency.
- The quality of the circulation of information: information is an integral part of the organization; therefore companies should be on the lookout for all the information. They also need to transmit it as soon as possible to make quick decisions which requires being in a state of constant surveillance and having tools to process and disseminate information.
- The flexibility of the structure: in the context of a dynamic environment, structures must have a flexible character. The system should encourage the participation in the decision making, the employee turnover and the multilateral communication.

3. HYPOTHESIS

Our research aims to diagnose the relationship between organizational innovation and organizational performance. As illustrated in the research model, we assume that there is a relationship between organizational innovation and organizational performance.

3.1. The relationship between internal sources of knowledge and organizational innovation

Knowledge and innovation are closely linked. To innovate, the company has to rely on its internal knowledge bases, to both benefit from them and incorporate the information and the external knowledge. Now, knowledge is no forgotten as a result of innovation, but as an essential element of the capacity of the firm to innovate.

According to Nonaka and Takeuchi (1997) "Understanding how organizations create new products, new methods and new organizational forms is important. However there is still a basic need to understand how organizations create new knowledge that makes these designs possible". Internal knowledge seems important for "innovation-generating organizations" (Damanpour et al., 2006), and is considered as a basis for the learning process leading to innovation (Lichtenthaler, 2009).

H(1): There is a positive relationship between internal sources of knowledge and organizational innovation.

3.2. The relationship between internal sources of knowledge and organizational

The internal sources of knowledge consist of production and knowledge sharing within the company (Lee et al 1999).

The debates focused on the importance of inter-organizational and network resources as a source of relationships, knowledge and sustained performance for the companies. However, the internal network is potentially an equal important source of knowledge that personal networks within the company are often the first point of contact for the employees. According to studies by Soo et al (2002), professional service organizations revealed that employees largely depend on their personal networks for information and knowledge. Indeed, the interaction between internal and external business and is important in the process of innovation.

H(2): There is a positive relationship between internal sources of knowledge and organizational performance.

3.3. The relationship between organizational innovation and organizational performance

The literature between innovation and organizational performance is not announced in the literature.

The literature develops innovation as a process in a variety of ways (Damanpour and Gopalakrishnan, 1998; Damanpour et al, 1989; Knight, 1967; North, Rogers, 1995; Thompson, 1965; Wolfe, 1994). Since the early work of Schumpeter (1934), innovation has been known as a key element of dynamic competition and market efficiency.

Therefore, the innovative companies develop faster, more efficiently and more profitable than non-innovative ones. That is why profitability can be defined as "the degree to which some financial indicators of the organization by increasing or decreasing compared to previous experiences or against a target" (Morin et al.1994).

"Organizational innovation also influences the performance of the company's quality of work, information exchange, capacity of learning and the use of new knowledge and technologies. It involves the implementation of new methods of organization of the routines and the procedures of execution of the works " (Dubé, 2012, p.7).

Cainelli et al. (2006) examined the interaction between innovation and performance in more detail and concludes that there is a two-way relationship: innovative firms outperform non-innovators, but the most successful companies are also more likely to innovate and devote more resources to innovation.

Therefore the evidence on innovation and performance suggests a positive effect on productivity and growth. There is evidence suggesting that external links, in particular with the customers, have a positive impact on innovation (Tether, 2005; Leiponen, 2005) and other evidence showing that innovation positively affects performance.

In addition, some authors found that innovation has a positive effect on the sales growth but not on productivity (Mansury and Love, 2008). However, this finding is in contradiction with the result found by Mairesse and Mohnen (2003) who found that there is a positive relationship between the level of productivity and innovation.

Organizational innovation significantly contributes to the performance, productivity and improvement of new goods and services and hence competitiveness and growth (Mayor, 2003). Although it is generally accepted that innovation has contributed to the business performance, companies must adopt some types of innovation over time that enable them to achieve a competitive advantage and enhance their performance (Damanpour, 1991; Hénard and Szymmsk, 2001; Porter, 1990).

The organizations that have greater innovation will achieve a better response from the environment, find it easier to improve organizational performance capabilities and consolidate a sustainable competitive advantage (Calantone et al, 2002; Hurley and Hult, 1998; Zaltman et al, 1973). Innovation has a direct impact on organizational performance (Hudges and Morgan, 2007; Zahra et al, 2000).

Some empirical studies indicate that innovation has no influence on business performance (Bierly and Westhead, 1990; Heunks, 1998), whereas others find negative implications on innovation performance (McGee et al, 1995 Vermeulen et al, 2005, p.442, cited by Rosenbusch et al. (2011).

On the other hand, , the likely adverse effects from an orientation of innovation and some contradictory evidence, theory and most empirical studies suggest a positive relationship between organizational innovation and organizational performance (Chen (2006); Damanpour et al, 2009, Eddlestone et al (2008,2009) Liao and Rice, 2010; Nranjo-Gil, 2009 Subrahmanya, 2005; Yam et al .2004, De Carolis and Deeds, 1999, Guo et al, 2005, Atuahene-Gima and Li, 2001, 2002, p.442, cited by Rosenbusch et al. (2011).

H(3): There is a positive relationship between organizational innovation and organizational performance.

4. METHODOLOGY AND MEASUREMENT OF VARIABLES

4.1. The sample

The sampling of empirical research phases is an essential step to ensure that the population has been correctly identified. This is the first step of the sampling process (Garrity et al, 2005). The parent population is the basis of deciding the sample to investigate. It can be defined as "all objects with the desired information to answer objectives of a study "(Giannelloni and vernette, 1995, p 153).

Out of the 435 companies that were contacted, only 228 returned the questionnaires, 200 of which proved actually usable. Our final sample consists of 200 Tunisian companies. We contacted 158 companies face to face, and 42 companies by e-mail (Following the difficulty of proximity).

4.2. Operationalization of variables

To address this variable, we used different researches, such as those of Lee et al. (1999) and Terziovski and Samson (1999). The respondents were asked to indicate their level of perception on each item of the variables.

- Organizational innovation

Organizational innovation is an independent variable measured by a Likert in five points going from 1 to 5. The codification on proposals is as follows: (1) not implemented, (2) imitated national markets, (3) imitated international markets, (4) The current organizational practices are improved, (5) organizational innovation is implemented.

The items by which this variable is measured were validated and used by the OECD Oslo Manual (2005). This involves the measurement of the elements of organizational innovations implemented in the organization.

- Internal sources of knowledge

The internal sources of knowledge are an independent variable. This variable is measured by six items. The respondents are asked to rate the importance of the potential of internal knowledge in the company using a Likert scale of 5 points from 1 = very poor to 5 = very high.

Based on the literature, this variable has been developed by several authors (Bierly and Chakrabarti (1996), Grant (1996), Nevis et al (1995), Zack (1999) where the items by which this variable is measured are inspired (validated and used by from the work of Lee et al. (1999).

- Organizational performance

Organizational performance is a dependent variable measured by a Likert scale of seven points ranging from 1 = not at all important to 5 = very important. This variable is measured by eight items.

Thus, the studies is used several measures of organizational performance. The dilemma which is confronted by researchers is that one performance measure can fully explain all the aspects of organizational performance. In order to address this problem, the researchers resorted to the use of multiple measures of organizational performance.

The measurements of performance depend essentially on the objective and the context of the research. Some of the variables proposed to measure this concept include the sales, market share, profitability, operational efficiency, business growth, competitiveness, customers satisfaction and productivity.

Items 1, 2, 3, 4, 5 and 6 are used by the work of Premkumar and King (1994) and items 7, 8 and 9 are inspired by the work of Samson and Terziovski (1999).

5.1. Data Analysis and Interpretation of Results

The data were analyzed in several phases. First, the factor analysis (principal component analysis with oblimin rotation) was performed on all the multiple scale items to determine the item retention. The exploratory factor analysis revealed that two of the internal sources of knowledge items, two of the organizational innovation items and two

of the organizational performance items did not meet our criteria. These items were removed before the final scales were computed by averaging the remaining items. Table 1 reports the results and the summary statistics of all scales.

Table 1.EFA factor loading

	Factor 1	Factor2	Factor3
Interne3	,023	-,071	-,862
Interne4	,055	,038	-,823
Interne5	,136	,011	-,761
Interne6	,014	,145	-,774
Innovorg2	-,062	,768	-,177
Innovorg3	,155	,832	,175
Innovorg4	,214	,724	,008
Innovorg5	-,162	,775	-,100
Innovorg6	-,032	,654	-,116
Innovorg8	,004	,763	,098
Innovorg9	-,022	,829	-,021
Performance1	,901	,030	,089
Performance2	,879	,023	,082
Performance3	,846	,061	-,064
Performance4	,762	-,014	-,080
Performance5	,808	-,078	-,146
Performance6	,742	,005	-,214
Cronbach's Alpha	0.924	0.886	0.868
Eigen value	6.751	3.300	1.549
Cum. Variance explained (%)			

To test the model in this study, AMOS 19.0 was used as the statistical tool to test the full measurement model. A two-stage strategy was used: first, confirmatory factor analysis (CFA) was carried out to evaluate the measurement model, and second the full model was tested to generate the path coefficients.

To examine the psychometric properties of the measurement model, Cronbach's alpha, convergent validity, and discriminant validity were assessed for the remaining 17 indicators. Cronbach's alpha reflects the internal consistent reliability among the indicators of a construct. As seen in Table 1 (Table 1.1: EFA factor loading), all the Cronbach's exceed 0.8, showing a satisfactory reliability for all the three scales.

A convergent validity is suggested if the factor loadings are 0.60 or higher (Chin et al. 1996, Bagozzi and Yi 1988). We found that the lowest loading was 0.589 which was very close to the ceiling. This finding provides strong support for the convergent validity of the scale. Next, to check the reliabilities of latent variables, CR and AVE were calculated using the procedure outlined by Fornell and Larcker (1981).

As shown in Table 2 (Table 2 :Construct reliability), CRs and AVEs of our scale are above respectively 0.72 and 0.5, except for the innovation latent variable at 0.482, but which was nevertheless very close to the ceiling. These results suggested the satisfactory the convergent validity of the measurement model.

Table 2. Construct reliability

Construct	Indicator	Loading	Composite reliability (CR)	Average variance extracted (AVE)
Internal sources of knowledge	Interne3	0.775	-	0.632
	Interne4	0.824	11.818	
	Interne5	0.794	11.368	
	Interne6	0.764	10.895	
External sources of knowledge	Innovorg2	0.813	9.140	0.482
	Innovorg3	0.804	9.073	
	Innovorg4	0.752	8.660	
	Innovorg5	0.713	8.314	
	Innovorg6	0.630	-	
	Innovorg8	0.589	7.124	
	Innovorg9	0.718	8.358	
Organizational performance	Performance1	0.696	-	0.622
	Performance2	0.654	13.637	
	Performance3	0.775	14.778	
	Performance4	0.815	10.674	
	Performance5	0.882	11.438	
	Performance6	0.898	11.604	

Source: Data from SPSS (18)

For the discriminant validity, Fornell and Larcker (1981) suggested that the square root of the AVE from the construct should be larger than the correlation shared between the construct and other constructs in the model. Based on Fornell and Larcker’s (1981) principle, Chiou and Lin (2009) suggested that the average AVE values of any pair of constructs should be larger than the squared correlation between that pair of constructs. Following this suggestion, the results given in Table 3 (Table 3: Discriminant validity of the theoretical construct measures) indicate that the three constructs have accept the discriminating validity.

Table 3. Discriminant validity of the theoretical construct measures

	Internal sources of knowledge	Organizational innovation	Organizational performance
Internal source	0.794		
Organizational innovation	0.404	0.694	
Organizational performance	0.641	0.286	0.788

Fig. 1 presents the structural analysis results. As seen in Table 4 (Table 4: Goodness-of-fit measures of the research model) the fit values of indexes such, as the RMSEA, TLI, CFI, and GFI, show that the full model fits the sample data. The path coefficients suggest that the internal source of knowledge has a significant impact on performance and on organizational innovation; however the latter has no significant effect on performance. Thus, hypotheses H1 and H2 are accepted but H3 is rejected (Table 5 Summary of testing results hypothesis).

Table 4. Goodness-of-fit measures of the research model

Goodness-of-fit measure	Recommended value	Fit index
$X^2/\text{degree of freedom}$	≤ 5.00	2.226
Goodness-of-fit index (GFI)	≥ 0.90	0.882
Adjusted goodness-of-fit index (AGFI)	≥ 0.80	0.839
Tucker-Lewis index (TLI)	≥ 0.90	0.926
Comparative fit index (CFI)	≥ 0.90	0.939
Root mean square residual (RMSR)	≤ 0.10	0.078

Table 5. Summary of testing results hypothesis

Hypothesis	Standardized Path Coefficients
H1: Internal sources of knowledge → Organizational Innovation	4.643
H2: Internal sources of knowledge → Organizational performance	6.698
H3: Organizational Innovation → Organizational performance	Not supported

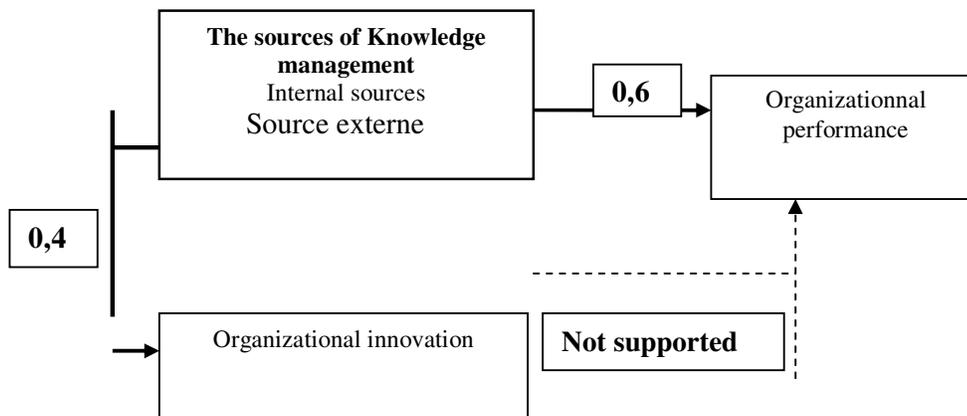


Figure 1: Conceptual model of the research

6. DISCUSSION

The importance of knowledge management for organizations has been widely discussed in recent years. Chronologically, organizational knowledge is generated internally (Paul, 2012). According to the OECD (2005), organizational innovation is nothing but the company’s adoption of new ways to produce. Today, only a few companies can sustain their competitiveness and innovation by focusing solely on the internal sources of knowledge. Very specific customer knowledge management, technology, markets, etc are the key to innovation (Paul, 2012). The relationship between knowledge and innovation has long been recognized.

The results of the confirmatory analysis of our research enabled us to validate our first research hypothesis .It is a relationship between the internal sources of knowledge and organizational innovation, with a correlation coefficient $CR = 4,643 > 1.96$ and $p = 0,000 < 0,05$

Our results are consistent with those of Cassiman and Vengeler (2006) who showed that there is a relationship between the internal sources of knowledge and organizational innovation.

Thus, in the Tunisian context, to innovate, companies must rely on these internal knowledge bases and enjoy them. In addition, the ability to integrate external knowledge and process this information enables the creation of new knowledge; that is the qualified internal competence of companies. Internal knowledge consists of qualifications, skills and experience of the staff and the knowledge placed in the process, in the organization, and in the databases. Certainly, the Tunisian companies promote and give much importance to internal knowledge lying within the organization for external knowledge of the various external actors. Therefore, internal knowledge is a basic source for the company.

Huber (1991) states that knowledge residing within the company cannot be acquired. Such knowledge is the experience that can be discussed, and can be objective.

The results of the confirmatory analysis of our research who enabled us to validate, our first research hypothesis with a correlation coefficient $CR = 6.698 > 1.96$ and $p = 0,000 < 0,05$.

Other works, namely, those of Slater and Narver (1995), give more importance to the internal sources of knowledge. These authors propose that effective managers use several internal sources to gain new insights for their businesses and for their environment. In fact, companies can develop knowledge by collecting pieces of information they get from other internal units.

In our research, companies give more importance to the internal sources of knowledge. This is explained by the experience of the various officers and employees. Indeed, they try to exploit and use their own information to achieve their set goals and improve organizational performance.

In addition, performance depends on the ability of the organizations to incorporate their resources to encourage the collaboration between the actors and facilitate communication and access to information.

In the Tunisian companies focusing on the effective use of the internal sources of knowledge, it is possible to obtain a competitive advantage by supplying other businesses which are more profitable and grow their businesses, etc.

Traditionally, business leaders are tied to organizational performance; hence the interest of researchers' focus is on this issue. Indeed, a company has a competitive advantage when it has the resources or skills that are unique and difficult to imitate and which enable it to provide higher customer's value. Some authors consider that this competitive advantage is possible through continuous innovation in an organization (Christensen, 2001; Porter, 1996, cited by Bochémier 2006)).

The results of our research have not validated our third hypothesis. The results of our research are inconsistent with the results of other studies focus on the positive relationship between organizational innovation and organizational performance resulting in increased performance (Deshpande et al., 1993; Dos Santos and Peffer, 1995; McGrath et al, 1996 and Fu Gao, 1996; Han et al., 1998; Schwab and Olson, 2000; Hult and Ketchen, 2001; Du and Farley, 2001; Calantone et al., 2002; Garg et al., 2003; Wu et al., 2003).

Our research coincides with previous research that has shown that there is no relationship between organizational innovation and organizational performance (Capron (1999) and Heshmati (2002)).

Therefore, in the Tunisian context, companies pay more attention to organizational innovation. This is explained by several things.

First, most of the Tunisian companies do not have specific departments to research and development. Thus, Tunisian companies apply organizational structures in accordance with the standards of the country. Second, given the lack of investment in innovation. Indeed, there is a difficulty to change and easily innovate the methods of the company's management practices in the work organization or external relations expertise strategies cooperation or alliance, tools, processes, organizational and managerial techniques to improve organizational performance. Usually, firms innovate at the organizational level depending on the priorities they define. They do so by applying a series of minor changes to their problem based emergencies. Certainly, renewals at the organizational structure facilitate teamwork and coordination between the different functions of the company.

7. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

We have to appreciate that organizational performance is an essential engine of the firms' activity of innovation. Moreover, innovation can lead to the development of specific strategic resources for the company; provide a competitive advantage and high performance which could help to reinvestment in innovation to gain a competitive advantage. The empirical verification of these proposals is to confirm or refute the assumptions previously made by administering a questionnaire to Tunisian companies and analyzing and processing the data using appropriate statistical tools. We found that there is a relationship between organizational innovation and organizational performance. The results obtained through the interrogation of 200 companies in our research test the causal structure of the overall research design and result in theoretical contributions, methodological and practices to be exposed.

The first contribution is theoretical order who is interested in the originality of our research justified by the lack of research that processed the enrichment explanation of the problems connected between the internal sources of knowledge management, innovation organizational and organizational performance.

The second methodological contribution is the development of a set of scales of valid and reliable measures. Indeed, on the basis of previous empirical work, we operationalized three variables (internal sources of knowledge, external sources of knowledge and organizational performance). We also note the limitations of our study. Finally, we assign a set of reflections that we have shown as extensions and paths for future research.

The first limitation focuses on the empirical study of different businesses and sectors. Moreover, conducting a study in different industries helps control certain specific circumstances, especially in the organizational performance of the company. However, this can limit the scope of the results, their extension to other contexts, and thereafter the external validity of the research. On the other hand, we identified some methodological problems, such as data collection. The fact that this research is based largely on the perception of different managers of firms covered with subjectivity, leads to more generalized results. This approach could cause some bias since most of the data required to measure the variables are intangible in nature, therefore it would be difficult and even impossible, to collect the data objectively.

Highlighting the theoretical and methodological limitations to this research shows that the achievement of other researches reform the current system of research. In addition, to the different lines of research proposed to overcome the various inherent limitations of this research, other possible extensions can be considered. They should be varied and concern both theoretical insights and methodological improvements.

The line of research would examine the external validity of this work. Indeed, it would provide, as part of further work to re-check our model on a single industry, to check whether our results are generalizable or not. Thus, the use of research as a field operating on a homogeneity of private and public companies in a single industry with using the internal sources of knowledge management to improve innovation and organizational performance, and to undertake on the significance of our results.

Finally, it can be left room for other variables in our future research. For this, it exhibits several advantages, creates homogeneous groups and allows you to be more efficient to submit faster. Again, we will encourage ordering objective measures with subjective measures to improve the validity of results.

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