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# **KIBS innovation management capability in Rural Portuguese regions: empirical Evidence**

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## **Abstract**

This article aims to evaluate the innovation management capacities of knowledge intensive business services (KIBS) and verify to what extent these companies return different profiles when classified by urban versus rural. Taking a sample of 500 KIBS, we applied a questionnaire with results revealing different explanatory variables for KIBS innovation capacities. From the set of five dimensions studied, factors relating strategy, learning, and network best explained rural versus urban KIBS innovation capacities.

**Key-Words:** Innovation, Knowledge intensive business, Innovation Capacity; rural versus urban.

## **Introduction**

Entrepreneurial activities, in conjunction with all the factors perceived as driving them, and their influence on regional economic development have been the subject of studies by a diverse range of authors (Birley, 1985, Kirchoff and Phillips, 1988; Storey, 1994; Acs, 2002; Cooke, 2002; Baumol, 2002; Autio and Acs, 2007; Henrekson and Joansson, 2010). Correspondingly, the *National Commission on Entrepreneurship* (NCOE) White Paper (2001) identifies innovation as the greatest contribution made by entrepreneurialism at the local level.

Since the 1980s, the vision of the traditional and linear model of innovation has been subject to change and placing greater emphasis on the more dynamic and

interactive facets (Kline and Rosenberg, 1986; Von Hippel, 1988). Currently, innovation is broadly recognised as one of the key drivers of economic growth in what has become known as the “knowledge society” (Stough, 2003; Mention, 2011). Hence, within a prevailing business context of ever greater competition, innovation is increasingly a critical factor for companies seeking to establish a dominant position in the marketplace (Cheng et al., 2010) and to boost their competitiveness (Hu and Hsu, 2008; Kaminski et al., 2008). Innovation is thus perceived as one of the main means of adapting to the ever faster dynamic surrounding environment (Roberts and Amit, 2003; Hua and Wemmerlov, 2006; Doloreux and Melancon, 2008).

Some progress has been made regarding the generalised acceptance of services, in particular Knowledge Intensive Business Services (KIBS), as fostering a rise in technology and innovation (den Hertog, 2000; Haukness, 2000; Muller and Zenker, 2001; Gallouj, 2002; Tether, 2003; Koch and Stahlecker, 2006; Sheamur and Doloreux, 2008). According to Miles (2001), KIBS are attributed a fundamental role as intermediaries in system innovation. The relationships between KIBS and companies in other sectors clearly delivers a positive impact on the latter businesses (Freel, 2006) enabling better performances in terms of research and development, employee skills, cooperation and networking and correspondingly enhancing innovation ratios.

From the perspective of Wood (2005), research on regional innovation has only echoed national studies in awarding primacy to regional competitiveness as a process guided and technologically driven by innovation. However, there has been growing recognition of the input made by innovation at institutions, especially KIBS, towards this same regional development and competitiveness (den Hertog, 2000; Wood, 2005).

The role of KIBS in regional innovation systems, especially in the support activities rendered to transformation industries and small and medium sized enterprises (SMEs) in general, has been identified by various studies (Cooke, 2001; Arvanitis, 2002; Czarnitzki and Spielkamp, 2003; Wood, 2005; Wong and He, 2005).

In Europe, since 1997, the diversification of rural productive activities has been established as an objective for rural development policies (European Commission, 1997). Similarly, there has been rising interest and demand for the means to set up and run new businesses, perceived as a key factor in development and revitalisation processes for certain defined European areas (Rosell and Viladomiu, 2001; OCDE, 2006).

Hence, and in accordance with the thesis that KIBS make major contributions towards innovation and consequently towards regional development and particularly of rural regions as detailed in our brief review of the literature, we pose the following research question: how do KIBS perceive and position themselves towards innovation in Portugal? Our study objective involves evaluating the innovation management capacities in effect at rural knowledge intensive companies as compared with their urban counterparts.

The article is structured as follows: in section two, we proceed with our review of the literature focusing upon progress in the study of service sector innovation and the extent of KIBS innovation in particular. In section three, we set out our methodology, the data range, sample selection and statistical methodology. In the fourth section, we analyse the results obtained before closing with some final considerations.

### **Service sector innovation**

Research into service sector innovation attained maturity in the 1980s (Kline and Rosenberg, 1986; Von Hippel, 1988; Johne and Storey, 1998; Miles, 2000; de Jong et al., 2003). Hitherto, there had been very little focus on service sector based innovation, a situation that Salter and Theter (2006) term an ‘omission’. As Miles (2000) describes, through to the 1980s, innovation in services had gained something of a “Cinderella” status as it was never invited to the ball with the emphasis exclusively on industrial and transformation sectors. Therefore, innovation in this era was perceived as associated with technological materials and equipment (Fucks, 1968; Bell, 1973; Abernathy and Utterback, 1978; Pavitt, 1984). However, as from the late 1980s and the mid-90s (termed the technological assimilation phase), with the rise of the service sector and the shrinkage in traditional industries in more developed economies, it became ever harder to ignore the innovation input of services (Grönroos, 2000; Hipp, 2000; den Hertog et al., 2003; Salter and Tether, 2006; Howells, 2007). In this period, innovation was approached from the transformation sector perspective. Corresponding to the advance of the service sector, there was a boom in studies broadly focusing on the impact of technology on services (Barras 1986, 1990; Galouj, 1998, 2002; Pires et al., 2008).

This reached such an extent that Barras (1986) made a particular effort to set out a theory on innovation in services taking into consideration the role that service sector based innovation might play within growth cycles. Given there was no service based

classification of innovation, the definition set out by Pavitt (1984) was transposed to the service sector by Miozzo and Soete (2001) as follows: (i) predominantly a service supplier, (ii) service networks, (iii) generate an intensive scale of service production, and (iv) specialist suppliers of science based technology and services. According to Miles et al. (1995), when seeking to identify forms of service innovation, these may appear in the forms of product innovation, which should derive from innovation processes and very often correspond to demand based needs, process innovation, emerging especially through new technology related drivers, and innovation delivery, in turn related with the application of new resources and methods such as new means of interaction between service companies and their clients.

Furthermore, Gallouj (1994) proposed the following formal innovation related activity categorisation: anticipated innovations, described as the most authentic form of innovation and correspondingly the least frequent type of innovation and the most difficult to implement (essentially consisting of coming up with something completely new), objective innovation, as the most frequent and incurring least risk (essentially the exploration of new methods or recycling those already existing), and value innovation (and essentially involving the leveraging of already existing experiences and the specialisation of capacities and knowledge able to nurture the appearance of new ideas and solutions). Subsequently, Evangelista (2000) classified services into four groups: (i) technological users, (ii) interactive services (iii) science and technological services and (iv) consultancy technological services.

As from the mid-90s, we may say that we entered into a new phase of service innovation research referred to by Salter and Theter (2006) as of 'differentiation'. In this period, researchers were already aware that service innovation differs from transformation sector innovation given the inherently different characteristics of services resulting in a parallel need to establish new approaches due to these intrinsic features of services (Miles, 2005). According to Muller (2001), after having criticised the traditional dichotomy between goods and services, innovation should be conceived of as an association of processes. Expressed alternatively: is the distinction between production innovation and process innovation relevant for the analysis of innovative interactions between the transformation industry and services? Contrary to the position traditionally taken by various authors (Gadrey, 1996; Tether et al., 2001; Djellal and Gallouj, 2008), innovation in services is perceived as something taking place very slowly. Services were thereby seen as incapable of innovating and ending up merely by

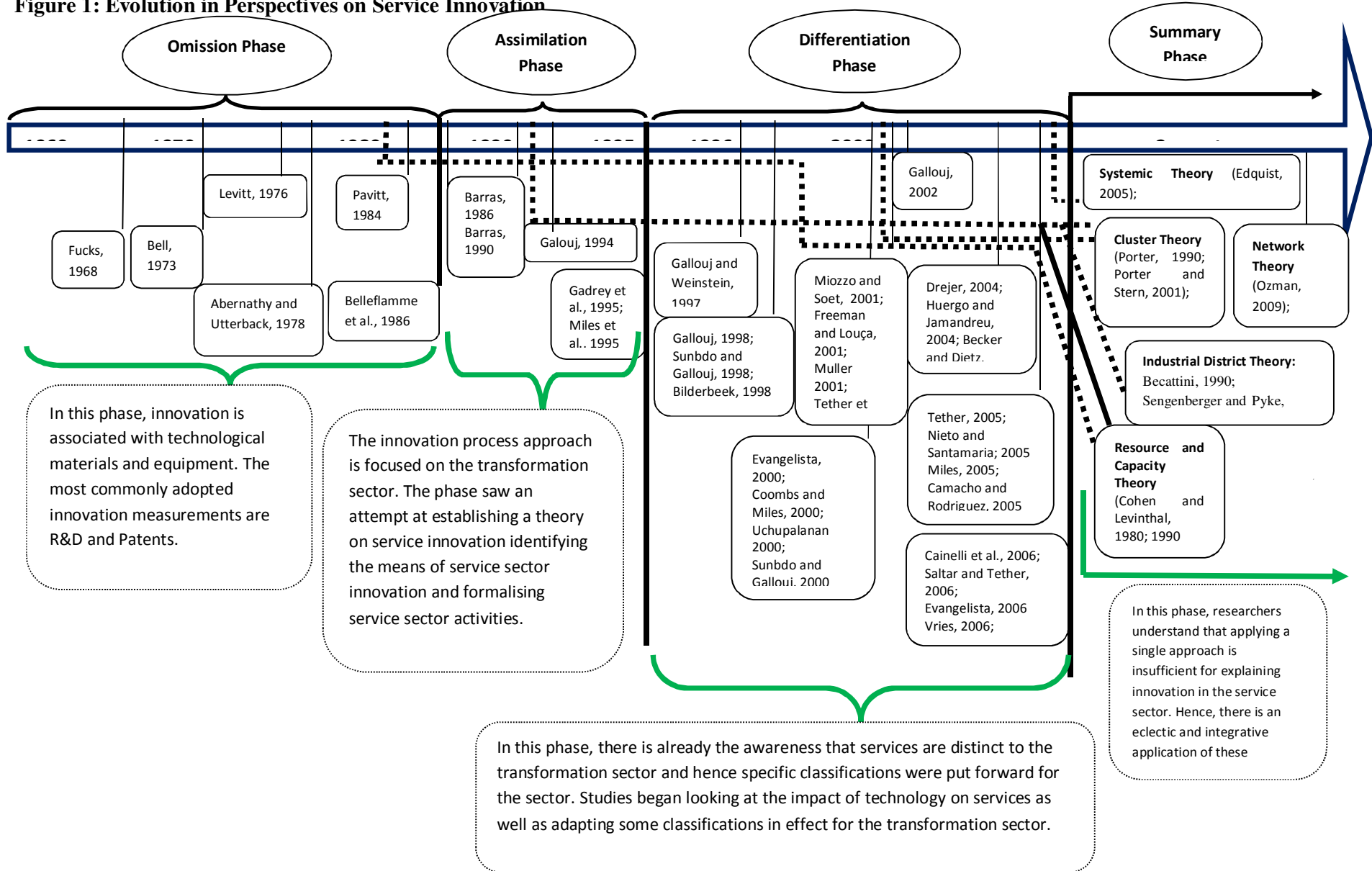
adopting the innovations generated by transformation industry companies (Gallouj and Weinstein, 1997; Tether, 2003). In effect, the point made by some authors is that the service sector innovates differently to the transformation industry (Tether, 2005; Cainelli et al., 2006; Evangelista, 2006). Hence, despite this rising awareness that innovation is not simply confined to technical processes and products, some recent research on innovation related activities has focused solely on observing technical innovation and in particular in the transformation sector industries (Becker and Dietz, 2004; Huergo and Jaumandreu, 2004; Lynskey, 2004; Nieto and Santamaria, 2005). Only more recently has greater importance been attributed to service sector innovation that had previously fallen broadly off the research agenda (Gallouj and Weinstein, 1997; Sundbo and Gallouj, 2001; Tether, 2003; Drejer, 2004; Tether and Tajar, 2008).

Currently, we may state that we live in a 'summary' phase in the academic construction of innovation in services (Salter and Tether, 2006). On the one hand, various authors draw on the knowledge generated by previous research and apply it to service sector innovation while on the other hand, new research approaches are emerging for the analysis of this theme as theory has not proven sufficient for explaining such a complex phenomenon and in a sector with so many specific characteristics as services. Within this overall perspective, we find that the main approaches may be broken down into: (i) the systematic approach and innovation systems (Edquist, 2005) that consider factors such as institutional organisation, culture and the history of the countries and regions where innovation takes place and is divulged thereby promoting company innovation capacities (Nelson and Winter, 1992; Freeman, 1987, 1988; Lundvall, 1985, 1988, 1992; Carlsson and Stankiewicz 1991; Nelson, 1993; Nelson and Rosenberg, 1993; Tödtling, 1995; Edquist, 1997; Cooke et al., 1997; Braczyk et al., 1998; Mytelka, 2000; Kaufmann and Tödtling, 2001), (ii) the network approach (Nelson 1993, Nelson and Rosenberg 1993; Breschi and Malerba 1997; Cooke et al. 1997; Fischer and Snickars 2001, Simmie, 2003; Lorentzen, 2008; Ozman, 2009) with its emphasis on the industrial network approach put forward by Hakansson and Johanson (1992), (iii) the clusters approach focusing upon the competition faced by companies in their immediate surroundings thus boosting their capacities for innovation (Porter, 1990; Porter and Stern, 2001; Furman et al. 2002) contrasting with the industrial district approach that considers the extent of cooperation and competition between companies (Becattini, 1990; Sengenberger and Pyke, 1992), (iv) the resource and capacity approach that stresses the utilisation of company

resources and internal capacities as fundamental to leveraging innovation (Prahalad and Hamel, 1990; Cohen and Levinthal, 1989 and 1990).

Within this framework, we may conceive of an evolutionary perspective of the different phases in studying service sector innovation (Figure 1).

**Figure 1: Evolution in Perspectives on Service Innovation**





## **Innovation Capacities at Knowledge Intensive Business Services**

KIBS form a service activity category susceptible to high levels of innovation as well as facilitating such changes in other economic sectors, including the transformation sector, essentially due to their core knowledge intensity characteristics (Miles et al., 1995).

This sector has turned in one of the the best growth performances in developed economies (Wood, 2002; Toivonen, 2004; Wood, 2006). KIBS are non-material companies providing intangible and highly personalised services that, on the one hand, act as external sources of knowledge to their clients and, on the other hand, are ever more the independent creators of innovation (Gallouj and Weinstein, 1997; Czarnitzki and Spielkamp, 2003). The majority of companies belonging to this sector are micro and medium sized young companies (Toivonen, 2004; Koch and Stahlecker, 2006; Koch and Strotmann, 2006). KIBS display capacities for storing knowledge and experiences in addition to being at ease in cooperating thereby lowering uncertainty and enhancing their ability to come up with innovative outputs (Cohen and Levinthal, 1989; 1990; Malerba and Torrisi, 1992; Johannisson, 1998; Becker and Peters, 2000; Lynskey, 2004; Schmidt, 2005; Koch and Strotmann, 2008). The technological and organisational managerial capacities characterising these companies also prove determinant to this innovation capacity (Lynskey, 2004; Webster, 2004). Therefore, the balance that KIBS attain between their internal capacities and openness to the surrounding environment represents one of the main factors for such innovation capacities (Deephouse, 1999).

According to den Hertog (2000), analysing the role of KIBS in innovation processes places the focus on the way that knowledge is produced and deployed in the economy in addition to the role of KIBS in these same processes. The production of a specific service is very commonly the result of combining efforts in the production of services, for example, in attending the client (with client satisfaction the primary objective) (den Hertog, 2000). KIBS function as catalysts fostering the fusion of various knowledge types, especially tacit knowledge, localised whether in the deepest internal company recesses or in the service sector (den Hertog, 2000, Strambach, 2001).

Within this context, attention must be paid to the concepts of “interactive learning” and “user-producer connection” within which KIBS play a preponderant role (Lundvall, 1988; 1992). We would highlight how KIBS may play three roles in supporting companies in other sectors: (1) facilitating innovation, (2) conveying innovation, (to the extent they play a fundamental role in the transfer of innovation),

and (3) as sources of innovation (to the extent they create and launch innovation) (Miles et al., 1995; Bilderbeek et al., 1998).

According to Sheamur and Doloreaux (2008), KIBS contribute towards regional innovation and competitiveness through their interactions with other local actors with the objective of producing innovation and, consequently, regional development. In this perspective, KIBS participate in regional development whenever these same regions display synergies and irrespective of whether or not KIBS are located in these or other regions.

Having thus far dealt with the importance of KIBS to innovation and how they contribute towards its incidence leads us onto the fulcral question: *what factors serve to evaluate this innovative capacity?*

### **Innovation capacity factors of evaluation**

While there is broad consensus with the position that innovation is fundamental to performance and sustainable competitiveness, there is no such agreement on just how this might be evaluated (Drazin and Schoonhoven, 1996; Tushman and O'Reilly, 1997; Kodama, 2006 and 2009). Innovation is perceived from different perspectives and these differ in the object of their focus: concepts and strategic considerations, methodology and models, measurements and analytical priorities (Souitaris, 2002).

Recently, researchers have displayed a particular interest in emphasising the characteristics of the companies and the factors leading them to innovate (Hwang, 2004; Lemon and Sahota, 2004; Tidd and Bessant, 2009). Some studies have defended that the emergence of new ideas, fundamental to company innovative capacities, depends upon the creation of knowledge (Cohen and Levinthal, 1990; Macdonald and Williams, 1994; Koc and Ceylan, 2007). Associated with the importance of creating new ideas comes the importance of its correct transmission, adoption and utilisation, to the extent that company members of staff are appropriately aligned and informed about the knowledge due to be conveyed, and all fundamental to the survival of innovative companies (Monge et al., 1992; Tidd and Bessant, 2009).

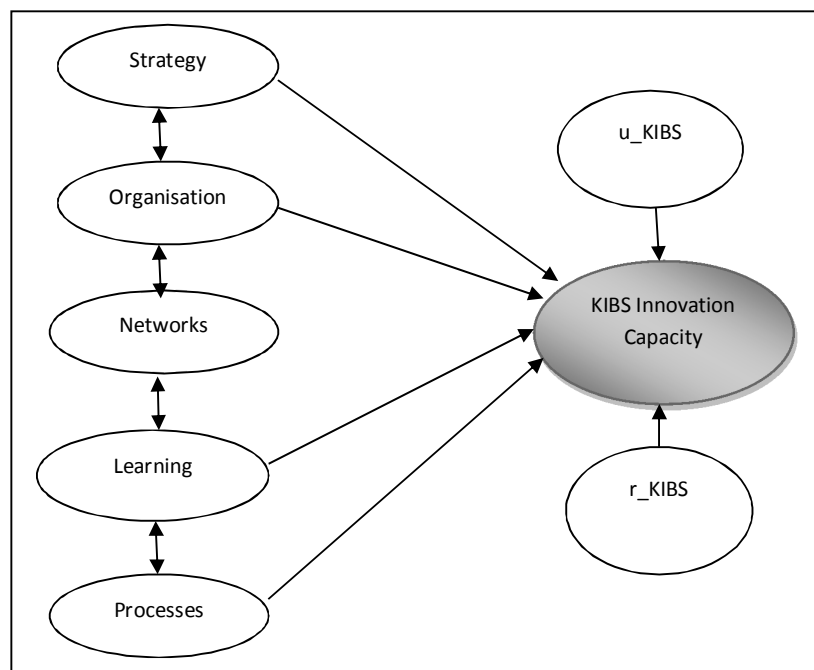
Some authors also propose the internal ambience of organisations, appropriately defining the innovation strategy and its communication to employees are also fundamental to innovation (Roberts and Berry, 1985; Wheelwright and Clark, 1995; Slappendel, 1996; Lemon and Sahota, 2004). As regards organisation, some specialists

pay particular attention to the organisational structure in conjunction with the interest shown internally in organisational innovation for example providing encouragement for staff participation in innovation processes so as to bring about still more innovation (Wheelwright and Clark, 1995; Slappendel, 1996). The organisational culture also leads to the production of knowledge held by different members of staff with different capacities but where effective and efficient team working takes place able to jointly solve problems and thus generate synergy effects (Amabile et al., 1996; McGourthy et al., 1996; Damanpour and Gopalakrishnam, 1998; Lemon and Sahota, 2004). Dussage et al., (1992) point out that taking the appropriate strategic options and organisational culture depend on costs, deadlines and the risk levels that companies are able to incur.

As regards process innovation, we may include innovations to products, processes, specific consumer needs as well as the acquisition of technology (Roberts and Berry, 1985; Cooper, 1990; Koc and Ceylan, 2007). More recently, attention has been attracted to research and development through internal investment, recourse to outsourcing, or establishing research networks as fundamental to innovative capacities (Moritra and Krishnamoorthy, 2004; Castellani and Zanfei, 2006; Frenz and Ietto-Gillies, 2007). According to Tidd and Bessant (2009), the evaluation of company innovative capacities should be carried out in accordance with strategy, organisation, learning, processes and networks.

Within this context, and as a means of evaluating the KIBS innovation capacity, we put forward the following research model (Figure 2):

**Figure 2: Conceptual research model**



## Methodology

### *Measuring the variables*

The innovation capacity variable was evaluated based upon five core dimensions: Strategy (S), Organisation (O), Networks (N), Learning (L), and Process (P). Each dimension was measured according to the set of indicators detailed in Table 1 below.

Table 1 – Analytical scope and measurement indicators

Dimensions	Indicators	Authors
<b>Strategy (S)</b>	S1- Do employees recognise the importance of innovation to competitiveness? S2- Is company innovation strategy clearly shared by all members of staff so everyone knows of the targets to be achieved? S3 – Do employees recognise that for the organisation to be competitive, distinctive skills are required? S4 – Does the company plan for the future and anticipate threats and opportunities (through recourse to forecasting tools and techniques)? S5- Do senior members of staff perceive innovation as a critical factor for company development? S6-Does senior management show commitment towards fostering and nurturing innovation? S7- Is the organisation equipped with the mechanisms for analysing new technological developments and markets and what is their impact on organisational strategy? S8- Is there a clear bond between innovation projects and the entire scope of the business strategy?	Roberts and Berry (1985); Cooper (1990); Dussage et al. (1992); Koc and Ceylan (2007); Tidd and Bessant (2009).
<b>Process (P)</b>	P1- Does the company have the means to manage new products from design through to launch? P2- Are innovation projects normally delivered on time and within budget? P3- Does the company have the means of verifying all consumer needs are truly understood and not merely at the marketing level? P4- Does the company have the process management mechanisms able to adapt procedures so as to guarantee a successful final outcome? P5- Does the company systematically research new ideas for new products? P6- Is the company equipped with the mechanisms guaranteeing the involvement of all departments in the development of new products and processes? P7- Does the organisation have a clear system	Roberts and Berry (1985); Cooper (1990); Koc and Ceylan (2007); Tidd and Bessant, 2009

	of choice for innovation projects? P8- Is the organisational system flexible and enabling the rapid implementation of small scale projects?	
<b>Organisation (O)</b>	O1- Does the company structure foster rather than hinder development? O2- Do employees work well in teams and across departments? O3- Are employees involved in putting forward ideas for improving products and processes? O4- Does the company structure foster swift decision making? O5- Does communication across different hierarchical levels work effectively? O6- Does the company have a system for supporting and rewarding innovation initiatives? O7- Does the organisation create a climate favourable to the creation of new ideas that encourage employees to come forward with proposals? O8- Does the organisation work well as a team (or teams)?	Roberts and Berry (1985); Dussage et al. (1992); Wheelwright and Clark, (1995); Slappendel (1996); Lemon and Sahota (2004); Tidd and Bessant (2009)
<b>Learning (L)</b>	L1- Is there major commitment towards employee training? L2- Does the company spend time either on reviewing projects in order to improve performance or on the performance of follow up actions? L3- Does the company analyse its errors so as to raise the standard of its activities and processes? L4- Does the company make systematic comparisons of its products and processes with those of its competitors. L5- Does the company share experiences with other companies in order to gain a better understanding of them? L6- Does the company record progress so as to enable other persons in the organisation to benefit from such learning? L7- Does the organisation learn from other organisations? L8- Does the organisation utilise measures enabling the identification of areas susceptible to improvement and innovation?	Cohen and Levinthal (1990); Monge et al. (1992); Macdonald and Williams (1994); Koc and Ceylan (2007); Frenz and Ietto-Gillies (2009); Tidd and Bessant, 2009
<b>Networking (N)</b>	N1- Does the company have good relationships (win-win) with suppliers? N2- Does the company understand well the needs of its end consumers/users? N3- Does the organisation work with universities and other research centres potentially able to help with developing its knowledge? N4- Does the company work closely with consumers to come up with new concepts? N5- Does the company cooperate with other entities in the development of new products and processes?	Moritra and Krishnamoorthy (2004); Castellani and Zanfei (2006); Frenz and Ietto-Gillies (2007); Tidd and Bessant (2009)

	N6- Does the company actively develop external networks with individuals able to render support (for example, specialists in specific fields). N7- Does the organisation share its needs and skills with education sector entities? N8- Does the organisation work closely with users of its products and services?	
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### *Sample*

The sample was founded based upon access to a data base containing a total of 34,971 KIBS granted by Grupo Coface. This was then searched to identify companies based upon their business turnover selecting only those companies recording revenues in excess of €0.01. They were then selected according to their Portuguese (CAE) business sector activity codes (REV.3) and NACE codes (REV 2), in keeping with the approaches of other, aforementioned authors (Frell, 2006; Miles et al., 1995; Doloreux and Muller, 2007, Shearmur and Doloreux, 2008).

The existing total of rural KIBS (93 companies) all fell within the scope of the sample with the remaining 407 KIBS urban in nature and hence companies located in urban councils with populations in excess of 5,000 inhabitants in accordance with the criteria set out by Kayser (1990). Taking into account this differentiation in location between the rural and urban environments, we identified the rural KIBS (r\_KIBS) and urban KIBS (u\_KIBS).

### *Methods*

Multi-group analysis has the objective of evaluating whether the structure of the measurement model and/or the structural model is equivalent across different groups and populations with different characteristics. In this scenario, we seek to confirm whether the items reflecting each respective factor are maintained when located in rural or urban environments and whether the factor weightings do or do not differ significantly in each case and hence whether the factor model remains constant across both company types. Model invariance in measuring factors of innovation in companies located in rural and urban zones was evaluated by recourse to AMOS software (v. 18, SPSS Inc, Chicago, IL). In the first phase, we adjusted the model individually to each of the groups.

The existence of outliers was evaluated by the Mahalanobis squared distance ( $DM^2$ ) with variable normality subject to evaluation by asymmetric coefficients (*sk*) and

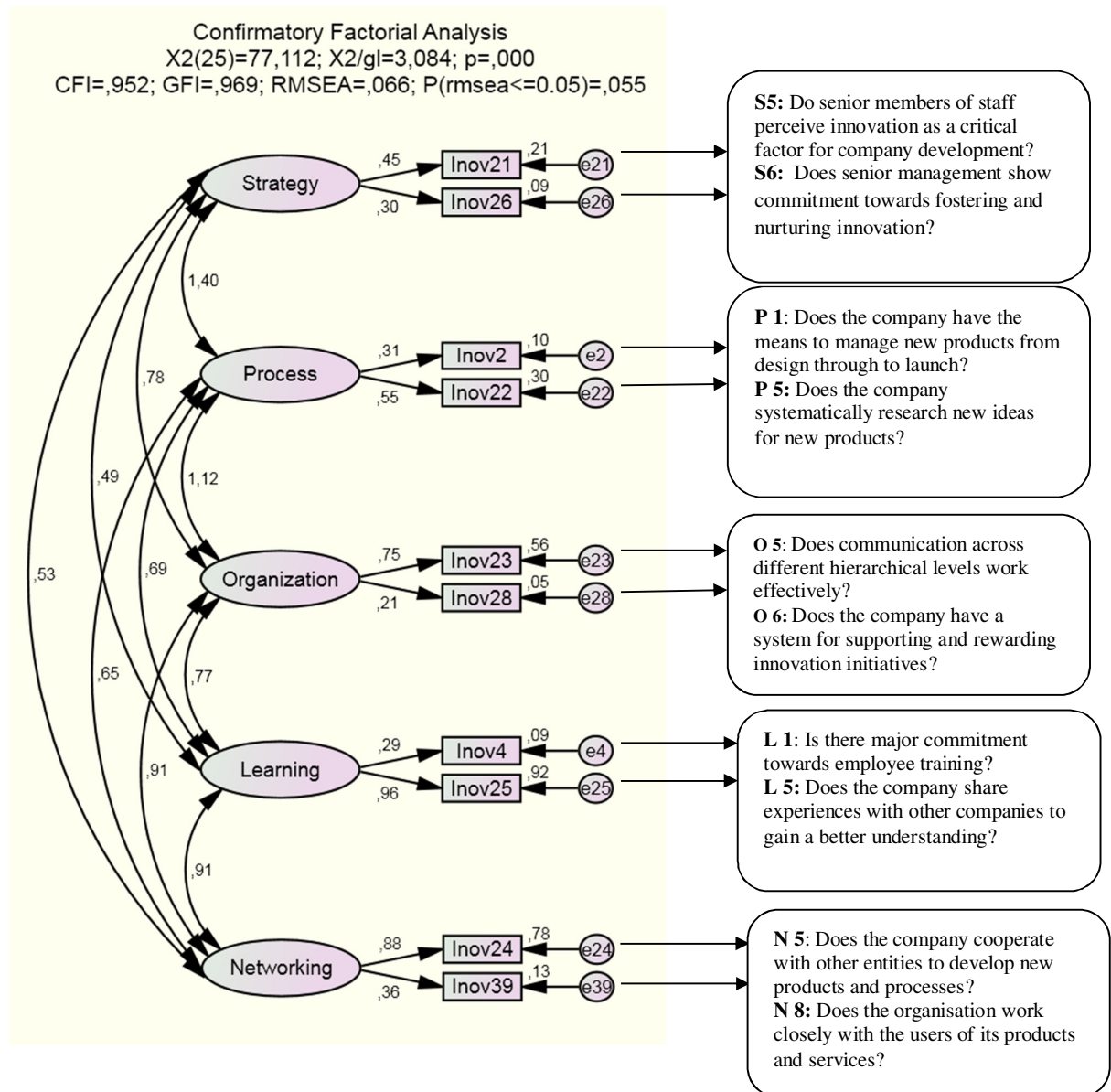
uni- and multivariate kurtosis ( $ku$ ). Fifteen observations returned  $DM^2$  values that suggested these observations represented outliers and hence confirmation factorial analysis was carried out on these observations. No variable recorded  $Sk$  and  $Ku$  indicator values in clear breach of normal distribution ( $|Sk| < 3$  and  $|Ku| < 10$ , see Maroco, 2010). The quality of the overall adjustment of the factorial model was made in accordance with the indexes and the respective values of  $X^2/df$ ,  $CFI$ ,  $GFI$ ,  $RMSEA$ ,  $P[rmsea \leq 0.05]$ . Model refining was attained based upon the values of indices modified by *Lagrange* multipliers (LM) produced by AMOS, considering that the trajectories and/or correlations with  $LM > 11$  ( $p < 0.001$ ) were indicators of significant variation in the model quality.

### **Analysis of Results**

Confirmatory factorial analysis of the factorial structure presented found that the model proposed here displays a good level of adjustment to the sample under study ( $X^2/df=2.125$ ;  $CFI=0.927$ ,  $GFI=0.968$ ,  $RMSEA=0.048$ ;  $P[rmsea \leq 0.05]=0.0538$ ).

Following the elimination of the items that do not contribute towards model quality, the invariance of the measurement model was evaluated for both groups through comparison between the free model (with factorial weightings and free factorial variances/co-variances) and a constructed model in which factorial weightings and free factorial variances/co-variances for the two groups were fixed. The statistical significance of the two models was subject to the Qui-squared test described in Maroco (2010). Figure 3 illustrates the estimates for the factorial weightings and the individual reliability of the model items.

**Figure 3: Estimates of factorial weightings and individual model item robustness**

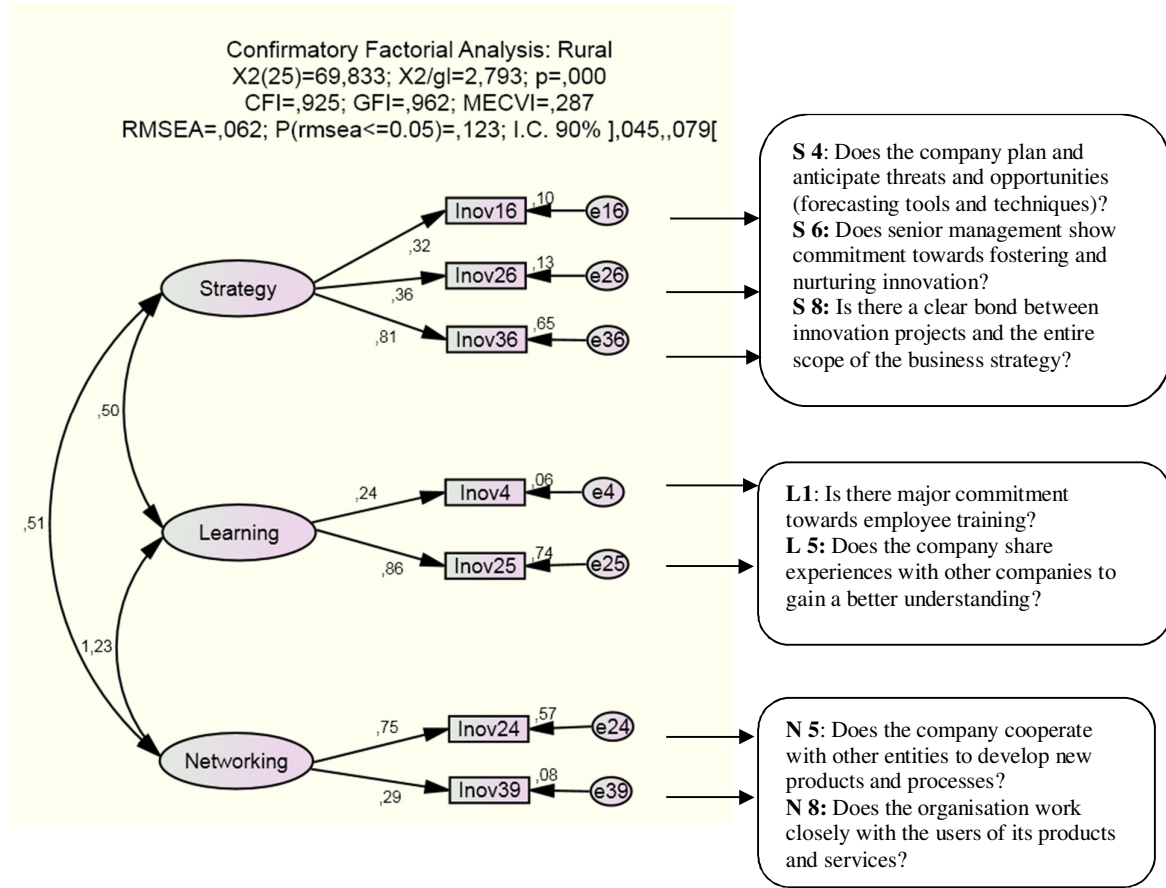


Taking into consideration how the results of this factorial analysis confirm all factors and having verified that those making the greatest contribution to explaining innovation are networking, learning and strategy, only these were adopted in the following analysis where we test these factors by KIBS type, whether rural (r\_KIBS) versus urban (u\_KIBS). Confirmation factorial analysis of the factorial structure illustrates the estimated factorial weightings and the individual reliability of the model items for rural

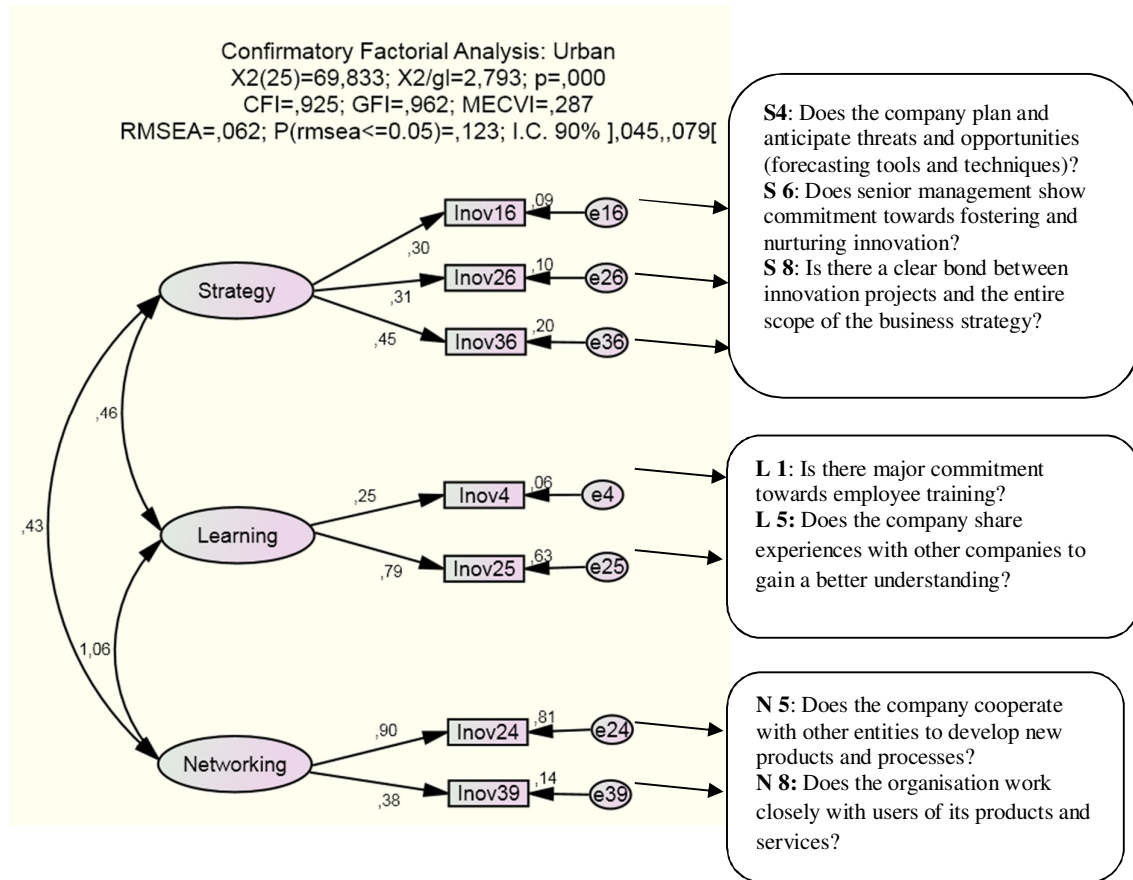


(Figure 4) and urban KIBS (figure 5). The model composed exclusively by the factors of networking, learning and strategy returns a good level of adjustment to the sample under study ( $X^2/df=2.793$ ; CFI=0.925, GFI=0.962, RMSEA=0.062;  $P[rmsea \leq 0.05]=0.123$ ).

**Figure 4: r\_KIBS Model**



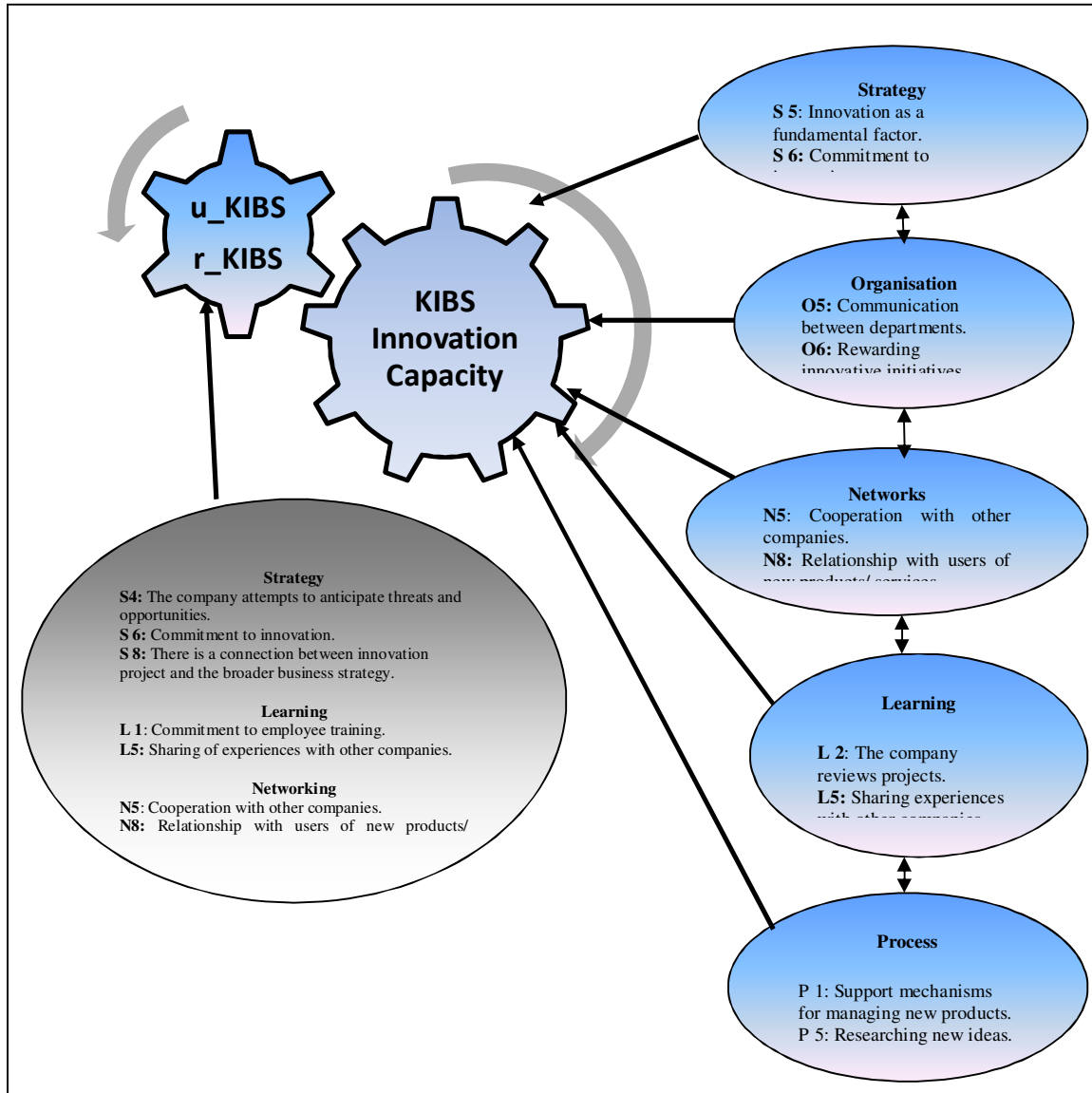
**Figure 5: u\_KIBS Model**



The models composed of the factorial weightings and variance/covariance fixed on r\_KIBS and on u\_KIBS did not register a significantly worse adjustment than the free parameters model ( $X^2_{dif}(4) = 2.178$ ;  $p=0.703$ ). We thus demonstrate the measurement model invariance between companies located in rural regions with those located in urban zones.

In summary, and taking into account the results obtained, we may (re)formulate the initially proposed research model as follows (Figure 6).

**Figure 6 –Empirical research model**



## Conclusion

The literature points clearly to the crucial level of importance of KIBS in innovation processes even while there is some difficulty in standardising the evaluation criteria as to what constitutes innovative capabilities. Hence, this study sought to analyse the capacity for innovation at knowledge intensive companies in Portugal through recourse to location (rural and urban).

In accordance with the model tested, it does prove possible to identify different variables contributing towards innovation capacities within the scope of the four different dimensions studied. Correspondingly, as regards the Strategy (S) dimension, innovation is perceived by senior management as a determining factor for company development (S5) and those holding senior positions display a commitment to backing innovation (S6). As regards the Organisation (O) facet, ongoing and effective communication between the various hierarchical levels (O5) and the company implementing a support and reward system for innovative initiatives (O6) seem to explain the existing innovative capacity. In the case of Networking (N), company cooperation with other companies in the development of new products and processes (N5) and working closely with users of its products/services (N8) impacted greatest on innovation capacities. Moving onto Learning (L), the two factors best explaining innovation capacities were the company spending time on reviewing projects so as to raise future performance standards (L2) and sharing experiences with other companies (L5). Finally, in terms of the Process (P) dimension, the fact that a company operates mechanisms assisting new product management, from design through to market launch (P1) and systematically researching new ideas for new products (P5) bear highest influence on company abilities to leverage innovation.

With this diagnosis of KIBS innovation capacities, we aimed to contribute towards better understanding the dynamics and differences in such knowledge intensive organisations. Its relevance derives from this company type proving crucial to competitiveness and development whether for the companies themselves or for the regions in which they are located. In addition, this research may be perceived as a step towards and assistance in defining policies both at the micro level of KIBS innovation management capacities and at the more macro level of fostering and developing the knowledge intensive business sector in Portugal.

The core limitation we would identify to this project, beyond the study being based upon a sample of companies and hence non-representative of the universe of KIBS companies in the country stems from the fact that all results have been exclusively obtained through factorial analysis. While this type of analysis is appropriate to our research objectives, were we to deploy more robust models, such as structural equations for example, the results might vary.

Therefore, we would suggest that future research applies structural equation models to this study in order to gain a more complete picture of knowledge intensive company innovation capacities and structured so as to generate a complete and simultaneous matrix of these companies (rural vs. urban; professional vs. technological).

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