
KNOWLEDGE INTENSIVE BUSINESS SERVICES: WHAT ARE THEY AND WHERE ARE LOCATED? SOME PORTUGUESE EVIDENCES

■ **Abstract:**

The importance of knowledge and innovation in modern economies justifies the increase interest by researchers in Knowledge Intensive Business Service (KIBS).

The role played by innovation KIBS is stated above all because of not having a single performance in innovative activity, as would be to simply meet the wishes of demand and more specifically to the wishes of its customers, but by creating knowledge bridges or innovation bridges between business and science. We aim to identify the nature of KIBS in Portugal based on dichotomy rural KIBS (r-KiBS) and urban KIBS (u-KiBS), and the typology professionals KIBS (p-KiBS) and technology KIBS (t-KiBS).

■ **Keywords:**

Intensive Knowledge; KIBS; location theories; Rural and Urban regions

■ **INTRODUCTION**

Despite growing awareness that innovation is not confined to sheer technical processes and products, some recent research on innovative activities has focused its attention only on technical innovation and, in particular, on the transforming industries sector (eg. [1],[2], [3], [4]). The importance of the services industry has only been acknowledged recently (eg. [5]; [6]). According to Tether et al. [7] innovation in the service industry companies is perceived as something that occurs very slowly. Services are perceived as being incapable of innovation, ending up adopting innovation generated by transforming industry firms. Alongside Tether et al. [8], Pavitt [9] also believes that smaller services firms are less likely to develop R&D roles, thus becoming recipients of technology and innovation produced in other sectors. Within the services industries, the rapid growth of Knowledge Intensive Business Service (KIBS) has exposed their major role in innovation

processes (eg. [10], [11], [12], [13]). The role played by KIBS in innovation process is affirmed, above else, by the fact that they do not have a simple performing role in the innovating activity, such as meeting demand and, more specifically, their clients' wishes. Rather, they act as builders of "knowledge bridges", or "innovation bridges", between firms and science ([14],[15]). Nevertheless, few studies have been made on the innovative activity carried out by this sector of services (eg. [16]). In the opinion of Howells ([17]), the fact that very few studies on innovation in the sector of services exist lies, basically, in the fact that this sector in particular is very heterogeneous in its origin, which disheartens many researchers. However, and according to Howells ([18]) there has been a constant rise in the number of firms operating in the sector of services. Particularly with regard small KIBS, their place as dynamic and core players in the "new" knowledge-based economies has been acknowledged. This

position has been achieved thanks to their innovative creations, in their own benefit, which means that they have ceased to be perceived as mere adopters or users of new technologies developed by others. This recognition has fostered recent research on this sector of services – KIBS ([19]). Furthermore, some KIBS are strongly technology-oriented, while others are much more concerned with knowledge of administrative and regulatory affairs. In this sense, this research aims to fill the gap in the literature concerning to nature of KIBS and their location. For these reasons, we decided to carry out a study about what are KIBS and where they are located in Portugal based on dichotomy rural KIBS (r-KIBS) and urban KIBS (u-KIBS) and professional KIBS (p-KIBS) and technology KIBS (t-KIBS).

The paper is structured as follows: next to this introduction, comes a theoretical framework of the characteristics, nature, and location of KIBS. In the third section, a brief characterization of KIBS distribution of KIBS in Portugal are developed, and the research conceptual model are proposed. In the end, the final considerations and future lines of research are addressed.

■ **FRAMEWORK OF KIBS: CHARACTERISTICS, NATURE, AND LOCATION**

Although the debate on the growth of KIBS swirls around their new specializations and the rise of the tertiary sector in general, it is becoming increasingly obvious that both the new manufacturing processes and the new services and innovations in general find their origin more and more on KIBS ([20]; [21]). Miles et al. ([22]) distinguish three fundamental characteristics in KIBS: (i) these firms pay a lot of attention to professional knowledge; (ii) these firms wish to be, in their own right, primary information and knowledge resources, or use their knowledge to produce services that act as intermediaries between themselves, clients and their production processes; (iii) the services that KIBS offer firms are extremely important to the latter, in terms of competition and competitiveness. Frell ([23]) concluded that technological KIBS¹ employ higher qualified people, and that this relates to their level of

innovation. In the case of professional KIBS, the author noticed that the relationship between them, suppliers and clients fosters innovation. As for the transforming industries, as it is not in their interest to invest in R&D, their level of innovation is extremely low ([24]). According to Amara et al. ([25]), KIBS arise out of knowledge-based services. In this type of industry, transactions take place at the level of knowledge, and outputs are often intangible. In most cases, innovations are the product of new knowledge combinations, instead of new combinations of physical artifacts.

Distinct authors have mentioned the role of KIBS in regional innovation systems, especially as support activities in the transforming industries and SMEs in general ([26]; [27]). Some progress has been made regarding recognizing services, including KIBS, as contributors to the increase in technology and innovation ([28]; [29]; [30]; [31]). According to Miles ([32]), nowadays KIBS are acknowledged as playing a key role as intermediaries in the innovation of systems. The relationship of KIBS with firms from different sectors has a visible positive influence on the latter ([33]). According to this author, this relationship increases resorting to R&D, enhances the performance of staff, and encourages cooperation relationships, thus increasing the ratio of innovation. In the viewpoint of Sheamur and Doloreaux ([34]), there are two perspectives that indicate how KIBS contribute towards regional development: (i) the way KIBS interact with other local players with the aim of producing innovation and subsequent regional development. Thus, this first perspective suggests that KIBS should be involved in the development of regions as long as synergy effects occur in the very same regions; (ii) on the other hand, KIBS may be involved in regional development, but instead of being in the regions, they may be located elsewhere in the country, and so be involved at a distance. From the two perspectives supported by Sheamur and Doloreaux ([35]), we are inevitably led to the question of location of KIBS. The location of these firms and their contribution to local economies have been analysed by several researchers ([36]; [37]; [38]). Their localization in the urban system, their sensitivity to the economies' general agglomeration ([39]; [40]; [41]) and their tendency to set up around spatial clusters ([42];

¹ The difference between technological and professional KIBS will be explained in methodology section.

[43]), have been documented through several tools and methodologies. A large part of these studies has been motivated by interest in researching the dynamics of local economies, regional development and the reason why some regions grow faster and more than others ([44]). According to Malecki, et al. ([45]), KIBS are essentially located in cities, as the latter are the optimum places for corporate innovation, as well as for networks leading to innovation. Sheamur and Doloreaux ([46]) present a distinct viewpoint, based on their study in Canada, whereby the sample was selected from Censuses carried out in 1991 and 2001. They selected KIBS from 152 urban agglomerations and KIBS from 230 rural areas. The authors then noticed that in the beginning of the 1990s, this service providing companies were, in their large majority, based in urban areas. The information yielded by the 2001 Census indicated, however, that these firms had moved out of cities into rural areas, thus leading to a drop in the KIBS sectors in urban agglomerations.

THEORETICAL APPROACHES ON FIRM LOCATION

According to Capello ([47]) there are two groups of theories (which she refers to as regional economics) that look into the issue of economic logic, which intends to explain the location of firms or, in other words, the existence of areas that are more developed than others: (i) Location theories: economic mechanisms that cause the distribution of activities in space; (ii) Growth and regional development theories: they focus on spatial aspects of economic growth and on territorial distribution of income. On the other hand, Hayter ([48]) set off to analyse the location of economic activity through three distinct approaches: (i) the neoclassical, which focuses mostly on the location theory and centres its analysis on profit maximization strategies and minimization of costs (transportation costs, human resources costs and external economies); (ii) institutional, which states that it is important to consider not just the firm's search for an appropriate location but also the institutional milieu it is part of (clients, suppliers, commercial associations, regional systems, the government and other companies); and (iii) behavioural, which focuses on situations of uncertainty and lack of information. Galbraith ([49]) studied 98 entrepreneurs of high technology firms in

Orange County, California (USA). He concluded that high-technology firms, in their location decision process operate within a framework of factors that are different from those observed in traditional industries. These conclusions are similarly shared by Arauzo and Viladecans ([50]) in their study on the level of spatial concentration of new firms (in the period 1992-1996) in the municipalities of Spanish urban areas. In fact, smaller cities appear to be preferred for the location of technology-based firms, as they offer a quieter environment, better quality of life and become highly advantaged by the presence of qualified individuals working in these industries. Felsenstein ([51]) based on a study on a sample of 160 firms, both in urban and non-urban areas in Tel Aviv (Israel), he analysed the trend of high-technology firms to choose urban areas as a location. The author concluded that the location of firms does not follow a strategy or a calculation; in other words, it is not a founded decision. In turn, Ferreira, et al([52]) identified three types of approach on the location of technology-based firms (behavioural, neoclassic and institutional) and argue that the rurality constitutes no obstacle to the location of firms. Based on review literature our conceptual model is the following (figure 1).

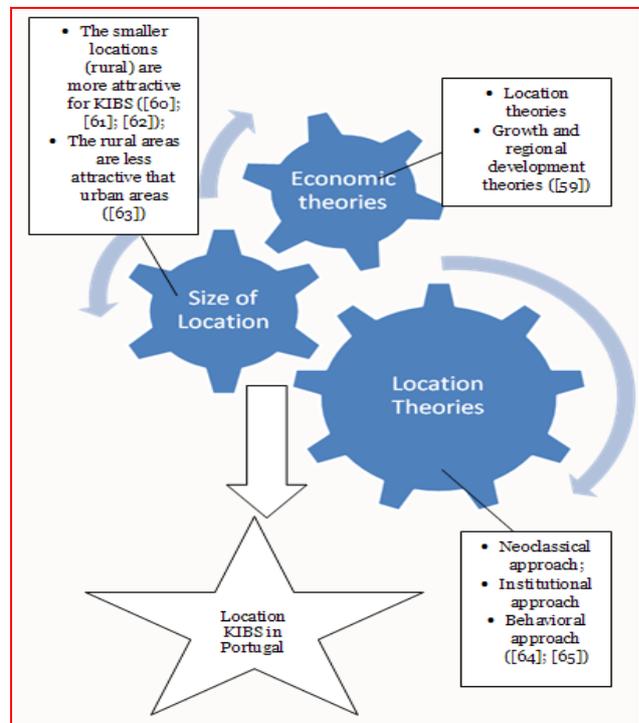


Figure 1: Conceptual Model

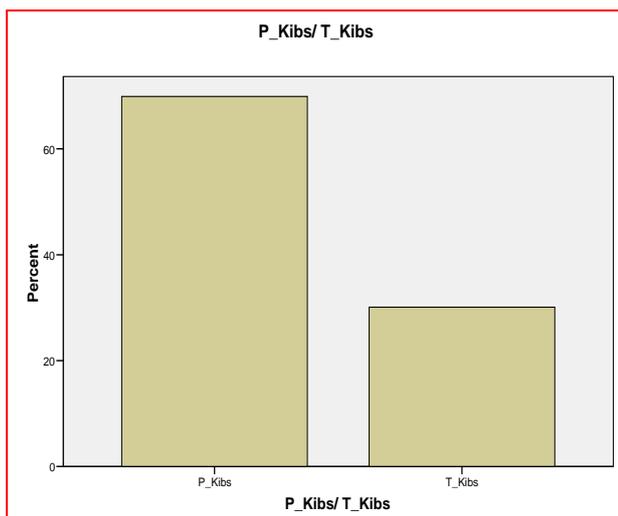
METHODOLOGY

KIBS were identified through use of database provided by COFACE Group integrating the total number of KIBS in Portugal created up to 2008 (latest year with available data). The extraction of the database was made from the turnover of the firms, i.e., only found that firms experiencing turnover exceeding € 0.01. These firms were selected for their CAE (Rev.3) codes and NACE (Rev. 2), as others researchers have mentioned already addressed. KIBS location was based on different theories of location and dichotomy rural KIBS (r-KiBS) and urban KIBS (u-KiBS), and typology of professionals KIBS (p-KiBS) and technology KIBS (t-KiBS) ([53], [54]; [55], [56]). The criteria that distinguish the rural and urban regions are not unanimous. Whether we seek a universal concept, with its boundaries of rurality, we cannot find. We will use the Kayser ([57]) criteria to distinguish the rural and urban regions. This author has used the resident population, which considered all rural areas with less than 5000 inhabitants, and all urban areas with people living above this value.

Table 1: KIBS distribution

P_Kibs/T_Kibs * Urban/Rural Crosstabulation

		Urban/Rural		Total	
		Rural	Urban		
KIBS	P_Kibs	Count	72	27371	27443
		% of Total	0,2%	69,7%	69,9%
	T_Kibs	Count	41	11770	11811
		% of Total	0,1%	30,0%	30,1%
Total		Count	113	39141	39254
		% of Total	0,3%	99,7%	100,0%



Graph 1: Number of P_KIBS and T_KIBS

We can state that in Portugal, from 39,254 KIBS, only 113 are located in rural areas which 72 are p-KIBS (table 1). Based on these data we can also evidenced that 69,9% of KIBS are p-KIBS and only 30,1% are t-KIBS. In terms of rural versus

urban is the most part of KIBS is located in urban areas (99,7%).

So, there is a greater incidence of professional KIBS in Portugal (graph 1).

FINAL CONSIDERATIONS

In the present research, we aimed to focus on two theoretical topics, which, due to their complexity, have gained increased importance. We started by referring to the growing interest on the study of KIBS, due to their influence on innovation and regional development. Subsequently, we referred about location theories that help us to explain how and why some types of firms are located in a specific place. Through a brief descriptive analysis we found out that there are, in Portugal, more professional than technological KIBS as well as its location is more characteristic of urban than rural areas.

The main limitation of our study is precisely the failure to apply our model empirically and the absence of statistical multivariate analysis in order to evidence the influence of the nature of KIBS in regions innovation. Therefore we propose in future studies to analyze these type relationships and to study the evolution and transformation that occurred in Portugal in relation to KIBS location in the last 5 years. These are issues that we have in mind and already in course.

REFERENCES

- [1.] Becker, W. and Dietz, J. "R&D Cooperation and Innovation Activities of Firms – Evidence for the German IPO Data". *Economics of Innovation and New Technology*, 2004, 15(1), 71-81.
- [2.] Huergo, E. and Jaumendreu, J. How does probability of innovation change with firm age? *Small Business Economics*, 2004 22 (3): 193-207.
- [3.] Lynskey, M. J. Determinants of innovative activity in japanese technology-based start-up firms. *International Small Business Journal*, 2004 22 (2): 159-196.
- [4.] Nieto, M. J. and Santamaria, L. Novelty of product innovation: the role of different networks. *Business Economics Series. Universidad Carlos III de Madrid. Working Papers #05-65*. November 2005.
- [5.] Gallouj, F. *Innovation in the Service Economy*, Edward Elgar, Cheltenham. 2002
- [6.] Tether, B. S. *The Sources and Aims of Innovation in services: variety between and*

- within sectors. *Economics of Innovation and new technology*. 2003 12 (6): 481-505.
- [7.] Tether, B., Hipp, C. and Miles, L. *Standardisation and particularisation in services: evidence from Germany*, *Research Policy*, 2001 30: 1115 – 1138.
- [8.] *Op. cit. Ref. 7.*
- [9.] Pavitt, K.: *Sectoral patterns of technological change: towards a taxonomy and a theory*, *Research Policy*, 1984, 13: 343-373.
- [10.] Muller, E., and Zenker, A. *Business services as actors of knowledge transformation: The role of KIBS in regional and national innovation systems*. *Research Policy*, 2001, 30: 1501–16.
- [11.] Howells, J.R.L. and Tether, B.S. *Innovation in Services: Issues at Stake and Trends*. Bussels, Luxembourg: European Commission 2004
- [12.] Toivonen, M. *Expertise as Business: Long-Term Development and Future Prospectives of Knowledge Intensive Business Services (KIBS)*. Doctoral Dissertation Series 2004/2, Helsinki University of Technology, Department of Industrial Engineering and Management. 2004
- [13.] Koch, A. and Stahlecker, T. *Regional Innovation Systems and Foundtion of Knowledge Intensive Business Services*. *European Planning Studies*, 2006 14 (2): 123-146.
- [14.] Miles, I. Kastrinon, N. Flanagan, K. Bilderbeek, R. den Hertog, P., Huntink, W. and Bouman, M.. *Knowledge intensive Business services. Users and sources of Innovation*. Brussels: European Comission 1995
- [15.] Czarnitzki, D. and Spielkamp, A. *Business Services in German: Bridges for innovation*. *The services industries journal* , 2003, 23 (2): 1-30.
- [16.] Koch, A. and Strotmann, H. *The impact of functional integration and spatial proximity on the post-entry performances of Knowledge Intensive Business Service Firms*. *International Small Business Journal*, 2008, 24 (6), 610-634.
- [17.] Howells, J. "Innovation and Services: New Conceptual Frameworks", *CRIC Discussion Paper 38* (Manchester: University of Manchester, 2000
- [18.] *Op. cit. Ref. 17.*
- [19.] Wong, P. K. e He, Z. L.: *A comparative study of innovative behaviour in Singapore's KIBS e manufacturing firms*, *Services Industries Journal*, 2005, 25: 23-42.
- [20.] KaraÁmerlioglu, D. K. and Carisson, B. *Manufacturing in decline? A matter of definition*, *Economy, Innovation, New Technology*, 1999, 8: 175-196.
- [21.] Tomlinson, M. and Milles, L. *The Career Trajectories of Knowledge Workers* (Paris: OCDE Workshop on S&T Labour Markets), 1999 Available at <http://www.oecd.Org/dataoecd/35/9/2101026.p df>.
- [22.] Freel, M. "Patterns of Technological Innovation in Knowledge-Intensive Business Services". *Industry and Innovation*, 2006, 13 (3): 335-358.
- [23.] *Op. cit. Ref. 23.*
- [24.] Amara, N., Landry, R. e Traoré, N. "Managing the protection of innovations in knowledge intensive business services". *Research Policy* 2008, 37 pp. 1530-1547.
- [25.] Cooke, P. "Strategies for Regional Innovation Systems", *Policy paper*, Vienna, United Nations Industrial Development Organization (UNIDO), 2001.
- [26.] Wood, P. "A service-informed approach to regional innovation—Or adaptation?" *Service Industries Journal* 25: 429–45. 2005
- [27.] Den Hertog, P. 'Knowledge intensive business services as co-producers of innovation', *International Journal of Innovation Management*, 2000, 4: 491-528
- [28.] Haukness, J. 'Dynamic innovation systems: what is the role of services?', in *Services and the Knowledge-based Economy*, eds. M. Boden & I. Miles, Continuum, London, 2000
- [29.] *Op. cit. Ref. 10.*
- [30.] Gallouj, F. *Innovation in the Service Economy*, Edward Elgar, Cheltenham. 2002
- [31.] Miles, I. *Services Innovation: a Reconfiguration of Innovation Studies*, PREST Discussion Paper Series, no. 01-05, University of Manchester, 2001
- [32.] *Op. cit. Ref. 23.*
- [33.] Shearmur, R. and Doloreux, D. *Urban Hierarchy or Local Buzz? High-Order Producer Service and (or) Knowledge-Intensive Business Service Location in Canada, 1991-2001*, *The Professional Geographer*, 2008 60 (3): 333 — 355
- [34.] *Op. cit. Ref. 34.*
- [35.] hUallach 'ain, B., and N. Reid. *The location and growth of business and professional service in American metropolitan areas, 1976–1986*. *Annals of the Association of American Geographers* 1991, 81: 254–70.
- [36.] Coffey, W., and Shearmur, R. "The growth and location of high-order services in the Canadian urban system, 1971–1991". *The Professional Geographer* 1997, 49:404-18. MacPerson.
- [37.] Gong, H. "A hierarchical change model of business and professional services in the United States". *Urban Geography* 2001, 22:340–59.
- [38.] Eberts, D, and J. Randall. "Producer services, labor market segmentation and peripheral regions: The case of Saskatchewan. *Growth & Change* 1998, 29: 401–22.
- [39.] Poehling, R. *Locating producer services in the rural South of the US: The case of Alabama, Florida and Georgia*. Paper presented at the

- Meetings of the North American Regional Science Association, Montreal, Canada, 1999.*
- [40.] Wernerheim, M., and C. Sharpe. "High-order" producer services in metropolitan Canada: How footloose are they? *Regional Studies* 2003, 37:469–90.
- [41.] Coe, N. "Exploring uneven development in producer service sectors: Detailed evidence from the computer service industry in Britain". *Environment & Planning* 1998, A 30:2041–68.
- [42.] Keeble, D. and L. Nachum. *Why do business service firms cluster? Small consultancies, clustering and decentralization in London and southern England. Transactions of the Institute of British Geographers* NS27:67–90, 2002
- [43.] Moyart, L. *The role of producer services in regional development: What opportunities for medium-sized cities in Belgium? Services Industry Journal* 25:215–28, 2005
- [44.] Malecki, E., Nijkamp, P. And Stough, R: *Entrepreneurship and space in the network age (Special issue editorial). Entrepreneurship and Regional Development*, 2004, 16: 1–3.
- [45.] *Op. cit. Ref. 34.*
- [46.] Capello, R. *Regional Economics. New York: Routledge advantage texts in economics and finance*, 2007.
- [47.] Hayter, R. *The dynamics of industrial location: the factory, the firm and the production system. New York: Wiley*, 1997
- [48.] Galbraith, C. S. "High – Technology location and development: the case of Orange Country". *California Management Review*, 1985, 28 (1): 98 – 109.
- [49.] Arauzo, J. M. and Viladecans, E. "Industrial Location at the Intra-Metropolitan Level: A Negative Binomial Approach". *Estudios de Economía Espanhola*, 224, FEDEA, 2006
- [50.] Felsenstein, D. "High – Technology firms and the metropolitan locational choice in Israel; A look at the determinants". *Geografiska Annaler Series B, Human Geography*, 1996, 78 (1): 43–58.
- [51.] Ferreira, J.; Marques, C.; Fernandes, C: "Contribution of location theories for Regional Development: an empirical study applied to technology-based firms". *International Conference on Entrepreneurship, Innovation and Regional Development, April 24-25, 2009, Thessaloniki, Grecia.*
- [52.] *Op. cit. Ref. 23.*
- [53.] *Op. cit. Ref. 14*
- [54.] Doloreux D, Muller E: *The key dimensions of knowledge-intensive business services (KIBS) analysis. A decade of evolution, Working Paper Firms and Regions No. U1/2007, Fraunhofer-Institut für System-und Innovationsforschung- ISI, Karlsruhe, 2007*
- [55.] *Op. cit. Ref. 34*
- [56.] Kayser, B. *La Renaissance Rurale, Sociologie des Campagnes du Monde Occidental (Paris: Édition Armand Colin)*, 1990.
- [57.] *Op. cit. Ref. 48*
- [58.] *Op. cit. Ref. 50*
- [59.] *Op. cit. Ref. 51*
- [60.] *Op. cit. Ref. 53*
- [61.] *Op. cit. Ref. 52*
- [62.] *Op. cit. Ref. 49*
- [63.] *Op. cit. Ref. 53*

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