



## **EXTENDED ABSTRACT**

**Title: Innovative activity and propensity to innovate in Extremaduran KIBS companies**

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### **Abstract<sup>1</sup>:**

Innovation is one of the pillars that sustains the productive dynamism of a company, region or country. The OECD (2010) recognizes that innovation is a key driver of growth of economies. Consequently, the European 2020 Strategy, agreed by the member states in June 2010, outlines a global plan for Europe, in which innovation is a fundamental growth tool. The promotion of private investment in innovative activities is, furthermore, a key element in companies' strategies through improved access to innovation financing.

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In this sense, one of the principal objectives of public innovation policies in many countries is to promote greater involvement of all kinds of companies in innovative activities in order to achieve increased knowledge which will contribute to an improvement in competitiveness and welfare.

Nevertheless, most government innovation support programs are still designed with the manufacturing company in mind and not companies in the service sector. Despite this, the service sector in the global economy has increased its interest in the dynamics of innovation and how to promote it effectively. Only recently is it seen in specialized literature that efforts are being made to specify the motivations and characteristics of an innovation policy that takes into account the particularities of the services sector and, specifically, of knowledge intensive business services (hereafter KIBS) (Aghion *et al.*, 2005; den Hertog, Rubalcaba & Segers., 2008; Toivonen, 2006; OECD, 2006; González, 2008; Cruysen & Hollanders, 2008).

In addition to public policies to support innovation, the study of the importance of innovation in services has also been introduced relatively late compared to the manufacturing sector because historically it has had a significant weight in the gross domestic product (GDP). Its study began to be taken into consideration at the end of the 1980s and the 1990s, motivated by the significant increase in spending on innovation in developed countries since the 1980s (Escauriaza, Subirana, & Torres, 2001). Participation of the services sector in GDP has in fact increased in recent years, reaching an average of 70% in developed countries (European Commission, 2012).

In general, the service sector has traditionally been considered as scarcely innovative. This is because of its heterogeneity and because the knowledge that is generated in some companies cannot be generalized to the entire sector, and it may not even be homogeneous within the same branch at the international level. Innovation in the service sector is different from that in the manufacturing sector, since the success factors are different (Ruíz *et al.*, 2006). There are important differences between the innovation strategies followed by the service and manufacturing companies, which are, in turn, a reflection of the differences that exist at the level of production and the characteristics of the products that both types of companies offer to the market. Services are intangible (Sundbo & Gallouj, 2000), production and consumption happen simultaneously, often there is no clear division between the service provider and the



service itself, they cannot be stored, and, in many cases, it is difficult to achieve standardization. These characteristics highlight the market failures that affect innovation activities in the services sector and make it more evident that they receive relatively less financial support for carrying out innovation activities compared to manufacturing (Crespi, Tacsir, & Vargas, 2014).

However, despite the heterogeneity of the sector, the services performed by KIBS companies could be defined as a "differentiating group" given that they act as transfer agents, supporters and sources of innovation for other sectors (Bessant & Rush, 1995; den Hertog & Bilderbeek, 1998; Miles *et al.*, 2005; Muller & Doloreux, 2009). These companies help client companies to innovate, generate, transmit and disseminate new knowledge (Zieba, 2013).

Based on this justification, the main objective of this research is to analyze the innovative activity and the propensity to innovate of KIBS companies in the region of Extremadura (Spain), and the relationship with public policies established to encourage innovative activity. In particular, we aim to identify the barriers to innovation that influence the innovative process of Extremaduran KIBS companies and their subsequent performance in innovation. Within this general objective, the following questions are addressed: what are the characteristics of the KIBS companies? What factors influence consideration of the importance (objectives) of innovation? What are the main obstacles to develop innovation activities detected by companies? What are considered the main benefits of innovation? What public actions are demanded to boost innovative activities? And, how do the obstacles affect the probability to innovate? Thus, the main contributions of the present study are as follows: identification and analysis of the benefits, objectives and main limiting factors to innovation performance focusing on the identification of their nature, origin and importance and the promotion of a better understanding of these factors, and to pave the way for future studies to identify best practices and overcome the constraints. Additionally, these aspects are linked with public actions that governments could put into effect in order to boost these activities in this sector. In this sense, Madrid-Guijarro, Garcia and Van Auken (2009), and Hidalgo and D'Alvano (2014) argue that understanding the factors that act as barriers to innovation can be useful for developing public policies that encourage innovation and for assisting managers to promote a culture of innovation in firms, as one of the determinants of the survival and success (Perel, 2002).



Data were obtained through an *ad hoc* questionnaire sent to managers of Extremaduran companies, from which KIBS companies were selected. Two waves of data are available: 2011 and 2013. The final sample was obtained from 777 companies in 2011 and 524 companies in 2013. From the total data, KIBS companies were filtered and selected. The final sample is from 163 companies in 2011 (97 companies in the province of Badajoz and 66 companies in the province of Cáceres). For 2013 the final sample is from 67 companies (35 in the province of Badajoz and 32 in the province of Cáceres).

From these data, various aspects related to the objective of the work are analyzed descriptively (for both waves of data: 2011 and 2013), and empirically.

Our empirical model has the objective to measure the effect of hampers of innovation on the ability of Extremaduran KIBS companies to introduce innovation. We use data of 2013 because from this year we have information about the perceived obstacles to innovation for innovative and non-innovative companies. Of the total innovative companies, 67.2% reported to have performed innovation activities (product, process, organizational or marketing) in the last 2-3 years; 53.7% reported to have performed only product innovation and 18% only process innovation. A binary choice probit model was employed to estimate the relationship, i.e. the impact of innovation obstacles on the innovation performance of KIBS companies in Extremadura. The model was run separately for each dependent variable (innovation, product innovation and process innovation). In general, the results reveal the existence of obstacles, mainly of a financial and market nature, which hinder innovation in companies.

In terms of the contributions of this research, the results obtained allow us to propose guidelines to encourage public and private entities formulate measures and policy proposals that are aimed at improving innovation performance and overcoming barriers to innovation. These policies must, first of all, ensure the process of creating knowledge based on research, an aspect that constitutes the essence of KIBS companies. Likewise, they should encompass to a greater extent the non-technological aspects that characterize innovation in services and in particular in KIBS. It is necessary, therefore, to adopt a broader concept of innovation that takes into account the importance of both technological (product and process) and non-technological (especially organizational) innovations. It would also be necessary to adopt financial incentives for both



technological and non-technological aspects to permit their access to the KIBS companies. Policies that stimulate demand for KBIS can also stimulate supply and quality. These measures are particularly important, given that Extremaduran KIBS businesses consist mainly of micro and small companies. As the study by González (2008) concludes, these measures take on special significance, especially in the case of peripheral regions and SMEs.

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