

Chapter 6

Technology Centres: An Extended Internal Labour Market for PhD Holders in Spain

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ABSTRACT

This chapter shows how PhD mobility across organizations constitutes a source of normative isomorphism that has led towards the “collegialization” of some Spanish Technology Centres (TCs). In particular, the study of nine TCs located in four Spanish regions has been essential to identify the normative mechanisms embedded in doctoral training and scientific careers that have promoted the convergence among R&D organizations. Thus, TCs collaborating intensively with higher education institutions through hybrid researchers have adopted academic models of knowledge production. Interestingly, they have also introduced doctoral training programs to reinforce their legitimacy in the eyes of their collaborators and investors. As a result of these changes, TCs move towards a more proactive position in the processes of knowledge transfer to gain an advantageous position in an innovation system.

INTRODUCTION

TCs are semi-public R&D organizations whose mission is to transfer scientific knowledge and technology to private sector (especially to Small Medium Enterprises – SMEs - that cannot afford to carry out their own research activities) (Cruz-Castro et al., 2012). It is noteworthy that their intermediate position in innovation systems allows them to bridge the existing gap between academic organizations and industry. In this context, TCs are in charge of acquiring the scientific knowledge

generated by universities to solve the real-world problems of their clients.

TCs depend strongly on external resources to achieve their transfer mission. Specifically, they require the scientific knowledge produced in academic organizations and the public funds from multi-level governments (regional, national and European) to face the high diversity of demands coming from a great variety of industrial sectors. The main problem is that these resources are extremely volatile (especially, the scientific knowledge that becomes obsolete in a very brief lapse of time), scarce, and highly demanded by a

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great variety of R&D organizations. In this context, TCs have implemented several strategies to gain access to these resources that are crucial for their activities. For example, they have diversified their funding schemes increasing their public funds; they have established collaborative relationships and partnerships with local and international universities; and they have recruited skilled employees to obtain scientific knowledge and to increase their opportunities to succeed in calls for funding. This study focuses on the employment of PhD holders in TCs as a strategy to get these resources.

A considerable body of literature has been published about the benefits of PhD mobility across organizations. In particular, several authors state that companies usually recruit PhDs to access scientific knowledge available in academic organizations and they distinguish three reasons for explaining this. First, PhDs have developed research competences during their doctorate that are useful to identify, decode, acquire and apply the scientific knowledge -characterized by being extremely theoretical, abstract and specialized- (Arora & Gambardella, 1997). Secondly, PhDs are used to deal with academic culture (rules and values regulating higher education institutions and their dynamics) because of their long-term socialization in a department (Park, 2005). Thirdly, PhDs have a professional network built during their careers that facilitates the establishment of partnerships with academic community, even at international level (Murray, 2004; Dietz & Bozeman, 2005; Thune, 2009). Interestingly, the majority of these studies have focused on scientific companies located in North American or European countries. However, little attention has been paid to the effects of PhD mobility on intermediate organizations with a technological profile, as the Spanish TCs.

TCs also need to raise public funds from multi-level governments to diversify their funding schemes and to reinforce their scientific capacities (Cruz-Castro et al., 2012). In this sense, some Spanish TCs use public funds to set up

their own R&D agenda and to anticipate future innovation needs of their potential clients. As in other countries, in Spain the national and regional governments have established a high competitive system to distribute equally public funds among R&D organizations according to performance indicators. In particular, scientific productivity (measured by number of publications, scientific communications, patents...) and the percentage of PhDs employed are the main points considered in calls. Thus, TCs are “forced” to employ PhDs if they want to succeed in calls for funding.

This research has been structured to pursue three main objectives: First, to describe how PhDs are involved in the acquisition of external resources in TCs, an example of intermediate organization not explored very much in the literature. This is also an excellent opportunity to determine whether a generalist organization with a technological profile use similar strategies to access extramural knowledge than highly specialized companies from scientific sectors.

Secondly, to analyze how the employment of PhDs in TCs impacts on knowledge production models, scientific careers and doctorate programs. In particular, this research aims at exploring whether TCs are introducing academic practices into their organization (process called as “*collegialization of industry*” by Kleinmann & Vallas, 2001) after the number of PhDs has been increased. In this sense, the new institutional theory of organizational change has provided a useful theoretical framework to understand the processes of isomorphism that organizations belonging to the same organizational field experience. Specifically, this theory has allowed describing how the mechanisms related to professionalism influence in the process of organizational change that usually experience organizations that depend strongly on their environment, such as R&D organizations.

Thirdly, to describe the patterns of doctoral education and employment in Spanish non-academic organizations. It is noteworthy that in this country the percentage of PhDs employed in private or-

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