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Success variables in science and technology parks

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ABSTRACT

Science and technology parks are of great importance in the business context of the region in which they carry out their activity. They are the main mechanisms of public and private initiatives for the promotion of research, development and innovation, and technology transfer. The main goal of this type of institutions is not a purely economic benefit, but also social and cultural, which makes them an appropriate investment from the public institutions' viewpoint. They promote the creation of companies and agreements with universities and research centers, generate employment, and attract technology-based companies. Therefore, they require in-detail assessment to understand their operation to generate action plans and models that new parks or those who are still in their initial growth phase may follow. This study establishes a series of models—or operation strategies—to identify the strategies of successful parks; that is, parks that have overcome the initial stage and handle high revenue volumes, high rates of land occupation, and a large number of employees.

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1. Introduction

No national or international agency questions the impact of research, development, and innovation (R + D + i) on the economy and the society of any country. After years of investment in these fields—primarily the efforts of institutions and public bodies (mainly universities)—advancing in the development of lines of work that allow a balance in R + D with a more active participation by private sector companies is a priority for the political, scientific, and business community. Within this context, science and technology parks (STP) play an essential role, because their existence represents an important factor in the competitiveness of the economy of a region or country, as well as a field for business investment. The Organization for Economic Cooperation and Development (OECD, 1987) defines STPs as zones of variable land areas that have the three following characteristics. Firstly, they concentrate high-tech industries and specialized service centers. Secondly, they have at least one university department or institute of technology with which hosted companies can communicate with each other in the material and intellectual sphere. Finally, they include an important component of research and development in the activities of the hosted entities.

The activity of STPs in Europe has nearly doubled in the last fifteen years. In 2013, 366 STPs exist in European Union member countries. These STPs have about 28 million square meters of buildings that host about 40,000 organizations of diverse nature, which, in turn, employ

approximately 750,000 workers. Furthermore, many of these organizations carry out works of high added value. The capital investment in the STPs between 2000 and 2012 amounts to approximately 11.7 billion euros. In addition, during the same period, these institutions have invested about three billion euros in professional business support and innovation services for their hosted organizations and other technology-based firms in their locations or close to the parks (European Commission, 2014).

Previous studies analyze the problem in other continents like America, to study the possibility of exporting the case of Silicon Valley to other regions (Wonglimpiyara, 2010), or Asia: the detailed study of parks specializing in information technology in India (Vaidyanathan, 2008) and China with the park that the Tsinghua University promotes (Zou & Zhao, 2014).

The case of Spanish STPs is especially interesting because of their path to organizational development (Vásquez, Barge, & Modrego, 2016). The first Spanish STPs emerge in the mid-1980s as a strategy of regional development without any formal link with universities or the central government. The main goal of these early parks is to attract large high-technology firms, because they boost economic and industrial development of the regions surrounding STPs' location. After some years, the parks begin to represent an attraction for universities, which begin setting up smaller parks joined to their facilities dedicated especially to R + D activities and the creation of technology-based firms. The recognition of universities' key role in knowledge and technology transfer leads existing parks to increase their efforts to create links with them and other research institutions. With the support of the central and regional governments, the Spanish parks start a period of expansion since 1999. Thanks to this support, the number of STPs

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