

Chapter 7

Factors and Dimensions of National Innovative Capacity

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ABSTRACT

A country's national economic capacity depends on that country's institutional efficiency, its national culture, and its Innovation framework. This chapter reflects upon the factors that influence national innovative capacity, based on the European Innovation Scoreboard database. By using clusters analysis to verify how different countries are positioned in terms of patent registration indicators, we determine which factors distinguish their innovative capacity. The results point to the existence of four groups of countries, and the factors identified point to aspects related to the institutional efficiency, the societies' cultural values associated with the level of hierarchy or "power distance" and with aspects such as the level of population with tertiary education and the percentages of expenses with research and development applied by the companies.

INTRODUCTION

Innovation as a concept or as an application has gone through profound changes. We may consider Innovation in the more traditional sense of radical Innovation when it follows the introduction of new elements, according to the (Schumpeter, 1934) per-

spective, or incremental Innovation when it follows the adaptation, modification and improvements of products, the development of processes or services.

Innovation may not be linear or sequential process, with origins in applied research, with a well defined sequence of connexions, but rather a system of internal interactions, of feedback, and forward or backward linkages, between functions and actors in

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a network of cooperation and in which experience and knowledge are accumulated and reinforced. Therefore we consider the need to have a more wide vision of the concept of Innovation.

During the 1970s and 1980s, the literature on the Innovation process started contesting the designated linear model, which assumes that technology is developed on the basis of scientific efforts and in which the research is followed by a progressive and sequential development.

Empirical studies have demonstrated that most Innovations reflect a process of feedback from the markets and the interaction between the production of knowledge and managerial initiative from the supply (Lundvall, 1999).

Thus, in opposition to the linear model of Innovation, we have noticed the rise of the systemic approach through the national, regional and local Innovation systems, published in several scientific papers (Braczyk, Cooke, & Heidenreich, 1998; Edquist, 1997; Edquist & Mckelvey, 2000; Guimarães, 1998; Lundvall, 1992; Lundvall, Patarapong, & Vang, 2006; Nelson, 1988, 1993, 2000; OCDE, 1997; Pavitt, 1999; Vang-Lauridsen & Chaminade, 2006) and Cross-Border Regional Innovation System (Tripl, 2006).

The objective of this paper is to reflect upon the factors that influence national innovative capacity. In this sense, and taking into consideration the data on 33 countries from the European Innovation Scoreboard Database, we analyze innovative capacity in terms of innovative output and patents registration, and identify the main factors which differentiate the countries' dynamics.

This paper presents the following framework. Section 2 consists of a literature review on innovative capacity, enhancing the importance of the Innovation systems. In section 3 we describe the hypotheses and the methodology. Section 4 contains the results and section 5 discusses these results and their implications, stressing the limitations of the paper and suggesting avenues for future research.

LITERATURE REVIEW

Innovative capacity has a decisive and crucial role in determining who is prospering in the global arena. Innovation is the base for the development of strategic advantages in companies, so necessary in the current context of global competitiveness (Porter, 1990). Thus innovative capacity enables countries to increase their productivity and attract investments, thereby sustaining continuous progress in the quality and standard of living.

(Suarez-Villa, 1990) introduced the concept of innovative capacity to measure a nation's level of invention and innovative potential. According to this author, measuring the innovative capacity may provide important knowledge about the dynamics of economic activity. Such knowledge may be used by policy-makers or academics for understanding the changes in the Innovation, technology and competitiveness.

At the national level, innovative capacity may provide comparisons about the evolution of inventive activity and its relationship with the main factors of invention, such as access to education and protection of intellectual property.

The concept of national innovative capacity was explained in the works of (Porter & Stern, 1999) Porter and Stern, (1999) and Stern, Porter and Furman (2001, 2002). Their main purpose was to measure the origin of the differences among countries regarding the innovative production, by analyzing the clusters of Innovation. For these authors, national innovative capacity is a country's capacity (as a political and economic entity) to produce and trade in a new flow of technologies, reflecting the fundamental determinations of the Innovation process, not only at the output level (Stern et al., 2001).

Several recent works have enriched this analysis. Each one enhances one or more determinants for the innovative capacity. In a managerial approach, Suarez-Villa, (2003) analyzed the relationship between the inter-organizational networks and innovative capacity, from which emerges a

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