Chapter 15
Mapping the Innovation Activities in Europe
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ABSTRACT
This chapter analyses the innovation activities and the way they contribute essentially to the regional dimension and growth. The chapter aims to investigate how technological infrastructure and innovation capabilities affect not only regional growth, but also the whole periphery and economy, as well as how technological innovation is essential if companies - and countries - are to maintain their competitiveness in global markets. Furthermore, this chapter describes the relative measures and indexes introduced by EU and OECD during the last years, concerning Research and Development Expenditures, patents etc., namely measuring innovation activities. However, there are a lot of underlying problems and questions regarding the measurement of innovation activities at a regional level. This chapter attempts to analyze the whole framework of innovation statistics and in particular to examine the measurement and also the statistical estimation of innovation activities in EU. Within this context, it is also aiming to emphasize and review the appropriate techniques, the most common methods and the particular related problems.

INTRODUCTION
The growing importance of technological change in world production and employment is one of the characteristics of the last four decades. Technological innovation is essential to maintain their competitiveness in global markets. The effectiveness of measures to stimulate or facilitate innovation depends to a very large extent on the ability of policy-makers to answer these kinds of question. Without a detailed understanding of innovation’s complex processes, resources may not be directed where they will do most good. There is a huge literature suggesting and demonstrating that research and scientific indicators make an important contribution to the growth at the firm, industry and national levels. Most of these studies
have investigated the relation between productivity, employment, growth and R&D.

The first important point is to distinguish between diffusion and the adoption of technology. In the analysis of adoption one considers the decisions taken by agents to incorporate a new technology into their activities. This paper investigates the mechanisms of knowledge economy. In addition, it examines the national system of innovations within the framework of the European technological policy and its effects to the member states.

LEADING INDICATORS OF SCIENTIFIC AND RESEARCH MEASURES

The main expenditure aggregate used for international comparison is gross domestic expenditure on R&D (GERD), which covers all expenditures for R&D performed on national territory in a given year. It thus includes domestically performed R&D which is financed from abroad but excludes R&D funds paid abroad, notably to international agencies. The corresponding personnel measure does not have a special name. It covers total personnel working on R&D (in FTE, full-time-equivalent) on national territory during a given year. International comparisons are sometimes restricted to researchers (or university graduates) because it is considered that they are the true core of the R&D system, (Bienaymé, A. 1986).

The use of research and technological data implied a lot of problems with the collection and measurement. The problems of data quality and comparability are characteristic for the whole range of data on dynamic socio-economic activities. However, most of the research and technological indicators capture technological investment in small industries and in small firms only imperfectly. Usually only, the manufacturing firms with more than 10,000 employees have established some research and technological laboratories, while industrial units with less than 1,000 employees usually do not have any particular research activities. Finally, the research and technological statistics concentrate mostly on the manufacturing sectors, while usually neglecting some service activities, (Dosi G., et. al. 1988).

The collection of R&D data of regional statistics implied a lot of problems in comparison to data of national statistics. For the collection of regional statistics, we should take into the local differences and the difficulties. R&D units can operate in more than one regions and we should allocate these activities between regions. Innovation indicators measure aspects of the industrial innovation process and the resources devoted to innovation activities. They also provide qualitative and quantitative information on the factors that enhance or hinder innovation, on the impact of innovation, on the performance of the enterprise and on the diffusion of innovation, (Korres G. 1996 and 2008).

The variables common used variables for S-R&T activities are:

- R&D expenditures
- R&D personnel
- Patents of New Technologies.

Technological product and process (TPP) innovations comprise implemented technologically new products and processes and significant technological improvements in products and processes. The term product innovation on the one hand includes technologically new products whose technological characteristics or intended uses differ significantly from those of previously produced products and on the other hand technologically improved products which mean that the performance of an existing product is significantly enhanced or upgraded.

Figures 1 to 3 illustrate the European Patent Applications (EPO), Gross Domestic Expenditures in R&D (GERD), and the Patents granted by United States & Trademark Office (USPTO), respectively.
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