Chapter 7
Towards Knowledge Driven Individual Integrated Indicators of Innovativeness

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ABSTRACT
Innovativeness of the enterprises is a key factor for the development of a national economy and has a crucial impact on the prosperity of a country. Governments spend a lot of efforts developing, organizing and then implementing national innovation systems. Proper functioning of such a system requires a lot of information to be gathered. The situation has to be constantly monitored as the innovation is an inherently dynamic phenomenon. An important goal of information gathering is learning a profile and specifics of the most innovative enterprises, promote them and make them more visible. Due to that some non-standard data analysis techniques are needed which can provide results of data gathering in a form suitable for the specific goals of the analysis. In this paper a pioneering system for innovativeness evaluation based on integrated indicators constructed for individual enterprises in Poland is described. An evaluation methodology has been developed, incorporating both quantitative and qualitative characteristics of the enterprises. The linguistic summaries of data are shown to be a promising data analysis tool, meeting the criteria which are discussed as relevant for the task considered. Briefly, these summaries make it possible to grasp the very essence of the collected data and communicate it in an intuitive, natural language like form.

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INTRODUCTION

Innovativeness of the enterprises is a key factor for the development of a national economy and for preserving its competitiveness. Governments spend a lot of efforts in developing, organizing and then implementing national innovation systems. Proper functioning of such systems requires a lot of information to be gathered. The situation has to be constantly monitored as innovation is an inherently dynamic phenomenon. Many problems have to be addressed, both at the methodological as well as statistical level. In this paper, a Polish programme of the use of micro-data for a multi-dimensional evaluation of corporate innovativeness is shown as a base for the improvement of communication among various stakeholders of the National Innovation System. The system covers the whole spectrum of the companies in terms of, e.g., their size, ownership and scope of activities. Thus, in particular, micro-companies, SMEs, and large as well as international corporations are well represented.

Though the paper is concerned with innovativeness at the national level, along the basic lines given in, for instance, (Archibugi, Howells & Michie, 1999), many papers in (Llerena & Matt, 2004), (Malerba & Brusoni 2007) or (Malerba & Cantner, 2007), similar issues and solutions may be found in the regional context (cf. papers in Baraczyk, Cook & Heidenreich, 1996, or Howells, 2005), or in a sectoral context (cf. Malerba, 2004). Clearly, specific features of Poland have been reflected taking into account analyses given in Baczko (2007a; 2007b; 2008; 2009a). The paper is in the framework related to the future science and technology and innovation indicators, and the challenges implied (Baczko, 2009b).

A characteristic feature of the system proposed is the use of public indicators of innovativeness which have been elaborated specifically for its purposes. This means a shift in the paradigm of public statistics. Namely, a classical statistical yearbook with averages is proposed to be supplemented with a new system of public indicators which can be used at the national and international level. This is in line with the recommendations of the Frascati Manual (OECD, 2003) and the Oslo Manual (OECD, 2005), and international statistical standards according to which these indicators can be easily adjusted to specific requirements of different countries and regions. This system covers many aspects, including market and process innovativeness, research and development expenditures, and the intellectual property rights as well as networking capabilities.

The development of the system was undertaken in order to accomplish various goals. The use of publicly available indicators makes the comparison of innovativeness of the companies more fair and objective. Thus, decisions related to fund allocation in public and private organizations may be based on a more sound basis and the risk assessment cost is reduced (Baczko, 2007a; 2007b). Setting clear, verifiable criteria for the assessment of innovativeness makes it possible to produce regular rankings of companies. This stimulates social processes focused on the dissemination of innovativeness patterns, increases the public awareness of importance of this issue and motivates companies to increased efforts. In fact, the results of such annual rankings based on the developed indicators are announced during the highly visible and prestigious Public Galas of Innovativeness. These events provide a perfect opportunity for developing social and information links among stakeholders of the innovativeness process.

During the preparations for the rankings, a lot of data on the companies in operation in Poland in the years 2004-2006 has been collected. To accomplish this aim, questionnaires containing both quantitative and qualitative data as well as public statistics, patents granted, stock data, firms reports, data concerning signed contracts of EU firms and experts judgments have been used. An important goal of data gathering has been to learn profiles of the most innovative companies. Due to