

# Chapter 5

## Complexity Economics and Innovation Systems: Mersin Regional Innovation Strategy (RIS) Plus Project From Perspective of Complexity Science

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### ABSTRACT

*Knowledge determines the relationship between regional development and innovation in a knowledge-based economy. The Mersin Regional Innovation Strategy (RIS) Plus Project is based on the European Union's new regional innovation strategy referred to as 'smart specialization' that is related with industrialization and economic development. This approach is an indicator of the change and transformation in the regional development paradigm in terms of knowledge generation and innovation processes. These developments also reflect the impact of complexity in the philosophy and understanding of the 21st century. Complexity Science and Complexity Economics have increasingly become determinants in the formation of institutional structures and policies within the global economic system. This chapter aims to evaluate the basic characteristics of Mersin RIS Plus Project within the framework of complexity science. This study discusses the development potentials of Mersin and TR62 regions in accordance with the scientific and theoretical basis of the project, and policy proposals are suggested.*

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## **INTRODUCTION**

The national and regional innovation system approach was adopted as an innovation strategy by institutions, such as OECD, the European Commission, UNCTAD, World Bank and IMF, after the 1980s and began to be included in policy texts (Lundvall et al., 2002, p. 214). Although this approach, implementation and period of globalization does not seem to be compatible with the process of change, the changing structure of technological knowledge, innovation, and especially the OECD's studies related to the evaluation of technological development and economic analysis, have been developments requiring systemic thinking. The system approach can be used on a local, national, international and global scale or as a methodology that can be applied on a sectoral and project basis. The 1960s and 1970s were the years in which the differences in growth and development among the countries increased, and the search for policies to address this issue involved great effort. Until the 1980s, innovations were concentrated in the industrial sector, technology and R&D-based, and able to be carried out by large companies that obtained patents, but later they transformed to be incremental, non-industrial, independent of R&D, and have a patent-free structure (Martin, 2013, p. 171). A new method of technological development, called 'innovation', which requires knowledge based on interaction, plays an important role in the formation of complexity science and complexity economics. Innovation economics, where tacit knowledge enters the production and consumption process as both input and output, is referred to as the 'knowledge-based economy'. Therefore, there is a close relationship between the knowledge-based economy, complexity economics and the innovation system approach.

The RIS Mersin Project is the first regional innovation system application that the European Union supported within the framework of regional innovation strategies in Turkey in 2005. This study evaluates RIS Mersin and its follow-up, Mersin RIS Plus projects, by taking into consideration the system approach that forms the basis of the innovation systems and the complexity science developed from the end of the 20th century. First, the contributions made to complexity science and system theory are discussed along with the changes in the philosophy of science. Next, the impact of these changes on the regional development paradigm are discussed within the framework of the knowledge-based economy, followed by an explanation of the evolution of regional innovation systems in Europe and the basic characteristics of the smart specialization strategy. Lastly, the innovation systems approaches taken as a model in the Mersin RIS Plus projects in the scale of the TR62 region are evaluated, and policies are suggested within the framework of the digital transformation of the knowledge-based economy, its global economic order dimension and the developments that emerged based on complexity science.

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