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The Typology of Theories of Innovation Systems Internationalization

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Abstract

This paper analyzes the part of innovations systems studies that focus on cognition of international dimension of such systems. The theoretical and practical studies on innovation system internationalization have increased from last of first decade of 21 century. In this paper 39 scientific articles, published from 1991 to 2017 have investigated, by using qualitative content analysis method. The approach of content analysis was deductive and for structured categorization we use quadruple notions of innovation systems (national, sectoral, sectoral and technological) beside internationalization approaches. After organizing analyzing of collected data we conclude that literature of innovation systems internationalization can divide to 8 different types. Also in recent years, we can see a conversion between different types of internationalization and a prominent example of this conversion is the notion of "global innovation system". The investigated literature about new industrialized countries, as successful samples, indicate this countries for the fulfillment of catchup process, have applied innovation systems attitude along with international involvement and attendance in global innovation networks and global value chains.

Introduction

The concept of innovation systems was introduced by Freeman and Lundvall in the 1980s with emphasis on the need for attention to institutions. This concept was quickly addressed by other researchers and many theoretical and experimental works were done on this subject.

In recent years, due to the development of globalization processes on the one hand and the expansion of innovation systems in developing countries, on the other hand, the internationalization of innovation systems has attracted the attention of many researchers and there is many critiques for not paying attention to it in the past. So far, various proposals have been presented by researchers to consider the international dimension in studies of innovation systems.

Since each scholar has different background and motivations, various types of internationalization of innovation systems have been created. In this paper, we try to present a typology of this emerging literature using the qualitative content analysis method.

Research Method

The present study was conducted on the basis of qualitative content analysis with a structuring approach, using a deductive method. The unit of analysis is manuscript. First we identify the works in the field of internationalization of innovation systems. Then two groups of theories were chosen as the basis for drawing up structured categorization matrix. First group of theories was the approaches to the innovation system (national, sectoral, technological and regional) and, second group of theories was the approaches to internationalization of the innovation system that we can distinguish between two approaches. In the first approach, named transnational bonds, innovation systems are created within the national boundaries, but as open systems, they have inputs (scientific, technological, financial, and ...) from outside the country. In the second approach, we have transnational (international or global) innovation systems consist of at least two or more countries.

By combining two internationalization approaches and four innovation systems approaches, we can reach to the structured categorization matrix.

Findings

We evaluated 39 studies carried out in the field of internationalization of innovation systems (theoretical and empirical), and then organized them based on the categorization matrix: 1. National innovation system by transnational links; 2. Transnational innovation system; 3. Sectoral innovation system by transnational links; 4. Transnational sectoral innovation system; 5. Regional system by transnational links; 6. Transnational regional innovation system; 7. Technological system by transnational links; 8. Transnational technological innovation system.

In addition to the predicted 8 type of studies, the concept of "global innovation systems" was a completely new conceptualization in innovation systems studies that introduced by Binz and Truffer in order to combining and converging various approaches to the innovations systems internationalization.

Results

Innovation systems perspective, is one of the most popular approaches in the past two decades for analyze the status of countries and suggest policy intervention for development. In recent years, various scholars with the help of other approaches

and concepts in the literature, such as global production network, global value chain, and etc. develop the concept of innovation systems and considered the international dimension for it.

Literature review shows that in recent years there is a convergence between different types of internationalization, and the obvious example is the concept of the "global innovation system". Theoretical and empirical studies have shown that newly industrialized countries like Korea and Taiwan have applied the attitude of innovation systems with international participation in global production networks and global value chains. Instead of producing purely indigenous knowledge, these countries have gained knowledge through international partnerships and increased their capacity for innovation.

International participation is possible in various functions of innovation systems (knowledge production, knowledge diffusion, guidance of research, resource mobilization, entrepreneurial experiments, market formation and legitimacy). The creation of diverse international links accelerates the development of innovation systems. Targeted use of international links alongside the national innovation system will lead to the promotion of industries towards more value-added activities.

Key Words: Innovation System, Globalization, Internationalization, Typology