# THEORETICAL APPROACHES FOR PROCESS OF INTERNATIONAL DIFFUSION OF INNOVATIONS

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In the process of innovation theory the concept of innovation diffusion is one of priority areas. Diffusion of innovation theory seeks to explain: how, why and at what rate new ideas and technology spread through different cultures. Diffusion can be defined as a process which has different intensity by which innovation spreads in a social system in time and space.

This theory was popularized by American sociologist E. Rogers in 1962. Rogers defines diffusion as the process by which an innovation (new ideas, processes or products) within the time passed through certain channels among members of social systems.

The process of diffusion of innovations studied using Mapping – the process of mapping the centers of the birth process, vector distribution and isochrones – lines connecting points at which innovation is penetrated at some moment.

Recent studies of diffusion of innovations made in the following two areas:

1) study of the mechanism of diffusion as systemic patterns of innovation: examines the internal laws and factors of diffusion of innovation (rate, scale, major effects and results from innovation, etc..);

2) study the spatial innovation diffusion: study factorial aspect of the diffusion process in different environment).

In the study of innovation diffusion speed is important diffusion of innovation, which depends on the susceptibility of the environment for innovation. There are barriers to diffusion (ethno-cultural, political boundaries) that do not allow innovation. The rate of diffusion depends not only on distance, but on the translational capacity of individual elements on which it is carried out, as well as the intensity and effectiveness of contacts.

Analysis of space-time process of global diffusion of innovation factors is the most important task today. The diffusion of modern, efficient technology has far-reaching consequences for the geography of economic activity, inequality and environmental quality.

While a country makes a decision or a direction of its policy on national technology development, it not only depends on its own situation, but may seek other countries' advice or experience. Theories of interdependence support mutual interdependence between nations from close interactions, resulting in reciprocity and complicity in policies.

The analysis of foreign scientific literature the last twenty years shows that there are two main categories of channel diffusion of innovations: the transfer of innovation and innovation spillover. Transfer of innovations presented well formalized and codified into categories based intellectual property forms, the most common licensing (purchase and sale of licenses) and franchising. Spillover of innovation is spontaneous dissemination of scientific and technical or other useful knowledge. Innovation transfer is different from the spillover primarily focused in the process and the presence of clear institutional arrangements.

If the transfer of innovations usually is international (according to some estimates, about 90% of the licenses sold abroad so as not to create any competition at the domestic market), the spillover of innovation can take place both inside the country and can be cross-industry.

Effect on the rate of diffusion of innovations can be by stimulating or, on the contrary, the leveling of the factors relating to both the internal and external environment. Theory of innovation diffusion is closely related to the theory of regional life cycle, where the process of production of goods is seen as a process with several stages: the emergence of a new product, its production growth, saturation reduction. Thus, at the stage of the emergence of innovation the most favorable place to house them are large cities, as in this case requires a large personal contacts.

Global firms look for attractive locations and partners that have complementary knowledge to offer:

- Attractiveness of an economy as a location for FDI is important – implying that sound macroeconomic and structural policies matter.

- Being at the high end of the innovation chain requires strong capabilities: high-performing universities and public research institutions, a well developed research infrastructure and excellent human resources.

- The quality of the system also depends on how well knowledge flows within the system and between system, e.g. industry-science linkages, clusters, openness to FDI, trade and highly skilled workers from abroad.

Some developing countries may benefit from the internationalization of R&D, but experiences differ:

- China attracted R&D FDI based on a large domestic market and strong human resources; Chile has not received significant R&D FDI;

- spill-overs from foreign R&D on domestic innovation are often limited.

- advanced economies are often more able to “embed” R&D FDI within their national innovation system (Switzerland versus China and Hungary).

- cooperation in innovation networks may offer greater opportunities.

- for most developing countries, other channels of knowledge diffusion will be more important for innovation, e.g.: international trade, FDI in production, licensing, international mobility of highly skilled.

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