Innovative Models of Increasing Competition and Competitiveness in Science

Author: Gabriel I. Năstase, Christian University “Dimitrie Cantemir” Department of Finance, Banking and Accounting, Bucharest, Romania, gabriel_i_nastase@yahoo.com

Technology transfer involves a series of relationships, formal and informal type among research units - economic development and public and private sectors. The purpose of the transfer is to strengthen the economy in a territory, by accelerating the application of new technologies and resources needs and opportunities for private and public sectors.

**Keywords:** innovative models, increasing competition and competitiveness, science

**Definitions and general mechanisms for technology transfer**

Technology transfer involves a series of relationships, formal and informal type among research units - economic development and public and private sectors. The purpose of the transfer is to strengthen the economy in a territory, by accelerating the application of new technologies and resources needs and opportunities for private and public sectors.

Technology transfer is the process by which knowledge, facilities or capabilities of existing publicly funded research and development, are used to meet the needs of public and private [8].

In principle, the results of successful technology transfer efforts, can show improvement products, efficient services, improve manufacturing processes, the development of new products for disposing of domestic and international markets. In essence, the technology transfer process involves three entities (Fig. 1.), Which were in a relationship of cooperation.
These entities participate, depending on each specific activity, technological change, one that involves:
• developing the basic concept (technological creativity).
• economically relevant experimentation on products and processes.
• Basic knowledge diffusion and their application.

Thus, technology transfer is seen in the most general sense, the transfer of research results in research and development units (universities, research institutes), in business firms or other parts of society [9]. The three entities involved in transfer of technology aimed at accelerating economic use of research results involving the transition from invention to innovation and dissemination of success on the market, creating added value.

Internationally, there is developing a wide network of organizations promoting competitiveness and technology transfer. These organizations have set up systems that interface between research establishments and industrial companies. The best-known international organization of technology transfer, noted:
• Federal Laboratory Consortium for Technology (FLC), Washington, USA.
• Association of University Technology Managers (Autm), Norwalk, USA.
• Competitive Technologies Inc.. (CTI), Fairfield, USA.
• British Technology Group (BTG), London, England.
• Technology Transfer Defense Evaluation Research Agency (DERA), Kenilworth, England.
• Institute for Industrial Technology Transfer (littala), Champs sur Marne, France.
• Center for Innovative Technology Transfer Bayern, Nurnberg, Germany.

In the past 15 years have been established in the U.S. and Western Europe becoming more such organizations. Thus, the U.S. technology transfer organizations number increased from 100 in 1983 to 400 in 1991. In Germany, between 1983-1988, 70 organizations were set up technology transfer, and in
France, the number of such organizations has reached 40. Gradually, after 1989, in the context of transition to market economy, such organizations have emerged in Central and Eastern Europe.

The main functions of these organizations are intermediaries and stimulate technology transfer. By providing facilities and technology services, these organizations seek application of innovation, technology transfer and quality management to increase business competitiveness, and providing advice and assistance to research and development organizations to adapt to new demands of globalization.

The specific objectives of technology transfer activities of organizations are:

**a) Supporting the industrial enterprises to:**
- Application of new technologies and modernizing existing ones;
- Improving the potential for cooperation with international partners;
- To attract grants and repayable, including risk capital funds;
- Improvement of quality management.

**b) Support research and development organizations that:**
- Be able to transfer the research results in economics;
- Can cooperate and assist businesses to implement new technologies and modernizing existing ones;
- Easier to adapt to globalization.

**c) Supporting the national, regional and international, by:**
- Conducting studies and research on science policy and strategy development;
- Attracting new participants in public programs, better information related to them;
- Attracting new sources of co-financing programs.

**d) Raising awareness and awareness on the concepts of innovation, quality and technology transfer by:**
- Developing and implementing educational programs on the concepts of innovation, quality and technology transfer;
- Measures to disseminate information in science, technology, innovation, including by means of information technology;
- Training / training of human resources involved;
- Methodological and logistical support activities for the benefit of doctoral students;
• Attracting young graduates to work specific programs;
• Promotion of the concepts of innovation, quality and technology transfer within firms and the public.

Transfer of technology through direct investment

Research on the international transfer of technology have not developed yet a clear framework within which to carry out a full analysis [7]. Therefore, useful conclusions can be studying the structure of technology transfer through direct investment, made by developed countries to less developed regions. Transfer of technology from Japan to East Asia has evolved gradually, as Japanese firms to outsource production and developed successfully. In a National Institute of Science and Technology Policy of Japan [7] have examined the effects of direct investment in a group of countries comprising South Korea, Taiwan, Hong Kong, Singapore, Thailand and Malaysia. International business development has made technology transfer in a complex and difficult to deal with. Old research on international technology transfer have lost validity. Therefore, the study cited above raises the question of developing measurement methods and appropriate analysis trend towards borderless economy (globalization) and innovative competition. Known product cycle theory (of Raymond Vernon), a theory of technology transfer processes of production in different geographical areas, argues that technological invention occurs in rich countries (where there are high levels of pay) and that technology is transferred, in particularly in countries with low levels of pay, depending on technology maturity. The expansion of multinational companies has triggered a deviation from the product cycle theory, which argued that the fundamentals of production are transferred from developed countries half developed country, and of these, in developing countries, in correspondence with the technology. The speed with which new technologies are running is far greater now than any other earlier stage. Multiplication is found where the right production decisions are based less on technology and on wage levels and more on corporate strategy of manufacturing companies. Globalization of economy is the corporate strategy that induces a hitherto unprecedented scale. Globalization of the economy has gained new dimensions and relevance in the context of the merger as more and more transnational companies. This real economic phenomenon has increased by 50% in 1998 compared to 1997, the number of companies involved doubled compared to 1996 [10]. The phenomenon was much identified May by Martin Carnoy, professor of economics at Stanford University (USA), which showed
that “large multinational companies continue to grow rapidly and to influence changes in the global economy. They also dominated trade between industrial countries and controlling international capital movements “[3].

Transition to the borderless economy has advanced to such an extent that companies have exceeded the product cycle theory and developed what is called the simultaneous structure of global production. This is a process that requires formation of a theory on the relationship between foreign investment and technology transfer [7]. The formation of this new theory, whether technology should be reconsidered, as stated many years ago, that time of transfer of technology should be rethought, since it appears rather as a “euphemism” as long as He refers to “something” that can be sold and, therefore, is a commodity that participate in the economic cycle [6, 2].

Returning to study on technology transfer of Japanese companies [7], it is useful to highlight the methods used. In this study analyzed the major color TV manufacturers and TV cameras, which have located assembly companies in East Asia. Criterion analysis of these producers was the transfer of technology and innovation. First, they examined various major components of the structure of color TVs and TV cameras, in connection with sources of supply. Based on such review, it was estimated that technology was transferred and where. This method clarifies the contextual circumstances of the transfer of technology to the company or between companies. Secondly, it considered the effect caused by technological progress on technology transfer. It was also investigated, innovative process for the manufacture of TV cameras. He made a qualitative analysis of the effect of each technological advance, which appeared in color TV production and TV cameras, an effect which occurred on transfer of technology. Results and conclusions of this study are:

1) For color television, technology transfer from Japan to East Asia has progressed through direct investments of Japanese firms. There is a distinction, the components, the degree of technology transfer. If TV cameras, the progress of technology transfer was slower than for color televisions. In addition, technology transfer can be divided into technology transfer within the company (in company) and technology transfer outside the company (between). From this perspective, the second transfer of technology was practically negligible.

2) Purchase of parts and components are made by major Japanese manufacturers network in the country of origin and in East Asia. This phenomenon is explained by the fact that there are structural limits to technological development, which creates a handicap in developing East Asia
production technology components and their implementation through local production.

3) Technological progress has occurred in parallel with the expansion of outsourced production, the acting on promoting technology transfer.

It was noted that a technology can be incorporated into a parts, components, in a car or a subset of equipment and that it can move. East Asia has adapted well to this movement. Integrated circuits in electronic applications are one example. In this case, leading technology is used in a “black box” and, the effect, today’s technology becomes more difficult to transfer.

The results of this study highlight other issues, more general, which may be subject to analysis. Areas in which Japanese companies operating in East Asia are supplying have diversified. Electronic component manufacturing technology has advanced remarkably. If East Asian countries to better understand technology transfer, which must be analyzed is the end product, but production of major components. On the line this cooperation, Japan and East Asian countries have close economic and technological relations. Also, many countries show a keen interest in Japanese science and technology, requiring technology transfers to raise their technological level. But the perception of technology transfer vary considerably between Japan and East Asian countries. In Japan, in general, thinks that increasing foreign direct investment by the private sector has contributed to developing countries “container”. It is believed that by building factories, hiring local workers, providing education and training, Japanese companies have increased their productivity by investing in countries’ container. Moreover, there attitudes in countries “container”, which expresses the idea that technology transfer is inadequate Japanese firms and that it must transfer higher-tech occupations and jobs for local workers, to the technological lead of countries development. Thus, technology transfer has become a political issue. Such a discussion can take place without a clear understanding of the status of technology transfer. One reason is that the term “technology transfer” is abstract and difficult to understand [7]. Theory “compatible technology” suggests that technology transfer to developing countries to open their technological advances. This theory is based on the idea that these countries face a range of problems in technology assimilation. This theory was inspired by the successive failures to placing factories in developing countries by developed countries, between 1960-1970. Theory “compatible technology” provides the best form of technology that developed countries can transfer to developing countries, is that local technical experts can manage. Interactive relationships between technological, cultural,
institutional innovation and economic development can be studied to find the causes of success in countries that have had the experience of development and technology transfer. Such success stories are the complex socio-technological transformation of developing the U.S., Japan and Sweden and are analyzed in detail, the Ake Anderson, TR Lakshmanan and Wei-Bin Zhang - a group of researchers from the Institute for the Future Study (Sweden) and the Center for Energy and Environmental Studies (USA) [1]. Inspired by the success of countries like USA, Japan and Sweden, many developing countries have tried in the last four decades, modern technology transfer experience. The experience of countries (South Korea, Taiwan, Singapore, etc..), Where there is moderate or high levels of recovery technology and high growth rates, confirming how complex the process of modernization through technology transfer even in conditions in which these countries enjoyed special support. The problems faced by these countries commitment to development through technology transfer experiment were basically the following:

- defining elements of successful development based on technology transfer;
- introduction of technology transfer conditions so as to ensure substantial growth;
- processes that trigger the transfer of technologies and / or change them according to local supply availability, prices and local social context;
- innovations that may arise during technology transfer;
- how the reasons for success and modernization of labor, the entrepreneurs and the general public;
- influence of tradition on the duration, speed and quality of technology transfer.

If East Asian countries, they have rapidly expanded their assembly industries through technology transfer organizations. Also, determine the trend of these countries to develop their own industries through association with firms from Japan and USA. Later, some of these countries has an increased role for the development of their technology, which has contributed to technology transfer organizations, which played an important role in strengthening domestic industries [5].

References


