INTERNATIONAL TECHNOLOGY AND KNOWLEDGE TRANSFER AS A TOOL FOR BUILDING A MODERN ECONOMY

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Abstract: The mechanism which allows for knowledge from abroad to travel to the domestic market is called the international technology transfer. It functions by using appropriate channels of distribution adapted to the form of knowledge being transferred, and by adapting to the level of development of the country receiving this technology. The use of external sources of knowledge where there exists a technological gap accelerates technological progress and reduces the costs of a country's advancement. At the same time, the under taking of national research and development is essential for proper absorption and expansion of knowledge coming from external sources. By adopting such assumptions, the process of international technology transfer should be considered as a tool that favors the building of a knowledge-based economy, particularly in terms of openness of markets and development of communication technologies. The aim of this study is to show the mechanisms of technology and knowledge transfer in the process of development of a given economy. Further more, the author of this study will also attempt to show the role of international technology transfer in the era of dynamic economic change. Reflections contained in the paper do not have definite characteristics and should be treated as an opinion in the discussion in fields management sciences.

KEYWORDS: globalization; competition; technology transfer; management; knowledge.

JEL Classification: E22, F21, F23.

Introduction

Globalization brings about many positive and negative phenomena that affect companies to varying degrees. One such phenomenon is called "the globalization of risk", which means the strengthening of global phenomena affecting the strategic decisions of the company. This arises from the increasingly complex and denser networks of capital, as well as economic and market ties (global spider web). Operating in such a complex, difficult environment requires strategic skills to manage risk, especially when it comes to strategic risk.

Globalization, which has caused a reduction in communication distance, has allowed for the transfer and diffusion of knowledge to be of quite a similar dynamic in both the international and domestic scope. As a result, the generation of knowledge through national human capital is a necessary, but not the only, factor in the development of a knowledge-based economy. Thus, an important issue in a given competitive economy are external sources of transfer of knowledge and technology. They often affect the economic condition of the country.

International technology transfer, which results in the spread of knowledge on an international scale, fosters not only the process of knowledge accumulation in the receiving country, but also knowledge generating. A sectoral analysis of modern economies points to the growing importance of the knowledge sector. This is assumed to mean there search and development area of broadly

understood education. The knowledge sector generates innovation as a result of market exploitation of knowledge.

A knowledge-based economy means that the production of knowledge and its use in the manufacturing processes becomes a systematic factor and a condition of efficiency and competitiveness, especially on a global scale. A global economy based on knowledge is undoubtedly one of the most distinctive trends in the evolution of the modern economy. It should be added that the manufacturing process always requires adequate portions of knowledge and there have always been some form of knowledge exchange between economies The difference today is the acceleration in the pace of production and knowledge absorption in the manufacturing process, the increasing specialization of production and diversity in knowledge transfer. The intensity of economic exchange between countries has also increased. This feature of the modern economy is vital for economic development in developing countries, separated by a technological gap from the technological frontier.

Research Methodology

The International transfer of knowledge and technology is a major factor in the development of many economies in the world. The aim of this study is to try to show the basic mechanisms present in the transfer of modern technologies in the context of economic development. The concept behind the implementation of new technological solutions, and their importance in the economy, is presented. Moreover, improvements to the determinants of innovation in the economy are also presented in this study. Attention is also drawn to opportunities and threats for companies caused by progressive globalization processes.

The basic thesis of this work is that the transfer of knowledge and technology in the sphere of business is a major factor in the market success of enterprises, and therefore it fosters the development of the entire economy.

The method of descriptive analysis, based on extensive literature studies, was used in this paper. The theoretical achievements cited are mainly English-language literature concerning mechanisms of knowledge and technology transfer in business and economic environments.

The issues presented in this work do not exhaust the list of problems that aggravate researchers in this field. The contents (threads) included here give a sketch of the issues in order to stimulate the asking of further questions, rather than looking for specific answers. They are to become an inspiration for further exploration, to expand the boundaries of our knowledge and research abilities in the fields of economic science.

Globalization and competitiveness: synergetic development

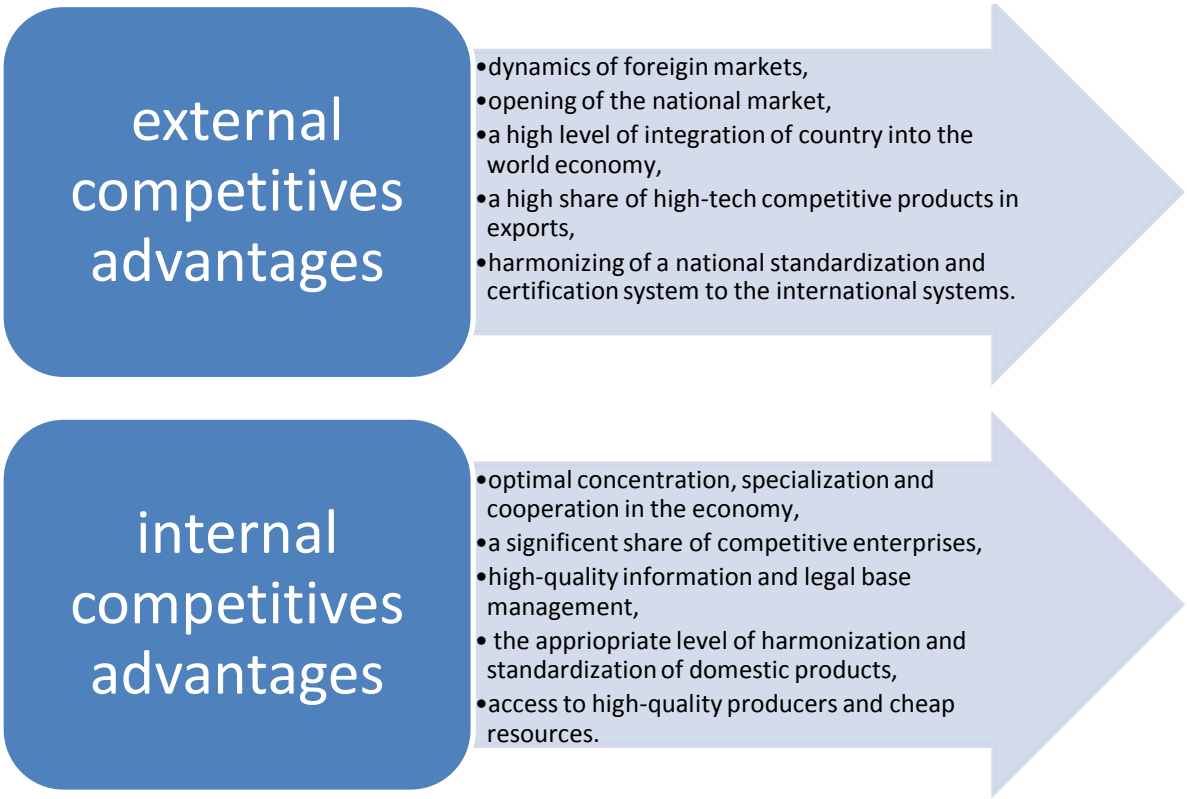
During the recent decades globalization has become the characteristic trend of the global economy; its multi-dimensional performance is in economies of scale and dynamism of the international movement of goods, services and factors of production, information, and technology (Kharlamova, 2013). On the one hand, this process accelerates the convergence of national economies; on the other it leads to increased interstate and interlocked contradictions and increased competition between subjects of international economic relations at regional, sub-regional and global levels.

Globalization is an objective process aimed primarily at implementing the requirements of international competition and making quantitative and qualitative changes in the competitive environment of the countries with both positive and negative effects. First, it reinforces the need for a new economic system based on market economy and thus actualizes the role of competition in general;

second, it contributes to the intensification of competition; and third, it dictates a severe competition, and as a result, modifies the competitive relationship (Kharlamova & Vertelieva, 2013).

So the economy of any country cannot develop and gain great competitive status if it is limited only by its own logical and scientific basis, operating in closed loop. World development, guided by the requirements of globalization for the free movement of factors of production and labour involves the openness of national borders. The distinguish features of economic globalization is unification and integration of the world economy and its unique synergistic effect. So, the globalization creates for every economy (state) wide range of internal and external competitive advantages (Figure 1).

Figure 1. External and internal competitive advantages (factors) of a state



Source: own research.

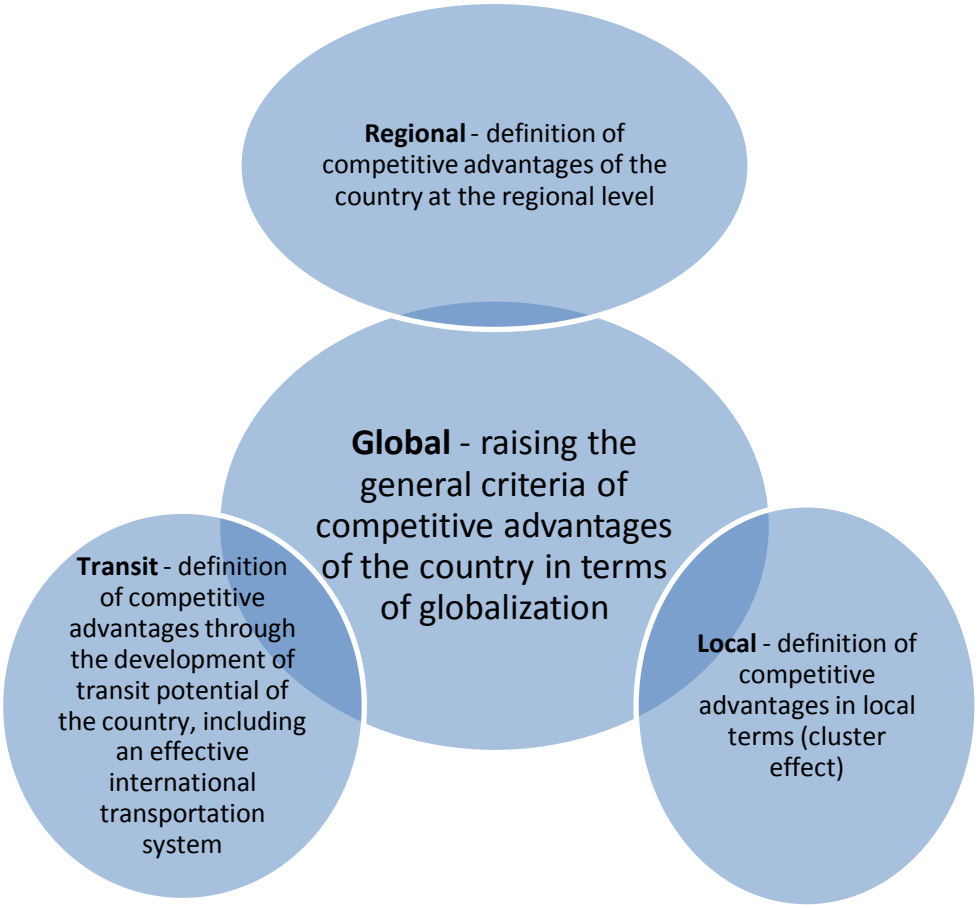
So the current level of global competition has led to the formation of a competitive advantage paradigm (Figure 1) which is mainly characterized by:

- continuous necessity of innovations;
- formation of such competitive advantages that cannot be easily replicated by competitors;
- high necessity to overcome the low level of technological, social, spiritual culture and management culture in order to become a member of international society.

The national competitiveness is an ability of a state to achieve high rates of economic growth, ensure a steady increase in real wages, promotion of domestic firms on the world market represented by high-performance clusters that improve the quality of products and services that enable the creation of new jobs in the future. This competitive ability to adapt to changes occurring in the global market is based on following economic factors such as investment volume, innovation ability, manufacturing

facilities, and others. However, their performance must be combined with political and social factors that also affect the functioning of the national economy in the world market. The analysis of economic development of states over the world through the prism of national competitiveness lets to draw the following models of national competitiveness enhancing (Figure 2).

Figure 2. Models of national competitiveness enhancing



Source: own research.

International competition – a multifaceted economic market category that reflects the struggle of civilizations, regions, countries, global complexes and specialized industries, global and multinational companies, financial institutions and other entities of the global space for competitive advantages. The competition is going on under a high level of monopolization, increasing of the overall impact of previously isolated factors, deepening of the participants' aggressiveness. All mentioned facts increased complexity of paradigm shift in states' development.

New technological solutions and their importance in the economy

In terms of advancing globalization, socio-economic development is determined, in particular, by the scale of competitiveness of implemented technologies, by the quality of a country's products, services, or by the introduction of organizational improvements. Competition, as an immanent feature

of modern development, forces innovation and change that are a creative response to occurring opportunities and market challenges (Lane, 2000). The attractiveness of the economy is determined by its ability to develop, absorb and accumulate various types of capital because an competitive economy is an innovative economy that generates, modifies, distributes and utilizes all types of knowledge (Dworak, 2012, pp. 20-22). Innovative enterprises are those that create new or improve existing products, methods of fabrication and organization of production by using professional knowledge.

Numerous studies and observations have indicated that poorer countries exploit the ability to import and imitate knowledge in the form of technological solutions. It enables them to achieve higher economic growth rates with lower levels of knowledge. The pace of real convergence is generally dependent on the distance between particular countries. The greater the distance and the economic backwardness of a country importing technologies compared to the most developed countries, the easier it is to overcome this distance.

Economic innovation is derived from existing pro-innovative resources (human, material, capital, information), skills and abilities to seek and permanently use the results of scientific research, development, new concepts, ideas, and inventions. Moreover, it is also derived from introducing new methods and techniques in management and organization, as well as from improving and developing infrastructure and knowledge resources. In turn, the ability to innovate is defined as a system of internal conditions and characteristics of a given region, enabling the creation of innovative processes. In other words, it is a combination of factors, features and regional potential that determines the effectiveness of resource creation and innovation processes (Nowakowska, 2011, pp. 86 -87).

On the one hand, innovative capacities can be analyzed as active abilities, based on the process of creation, absorption and diffusion of innovation in the economy. On the other hand, they can be viewed as passive abilities that focus only on the process of absorption and imitation without the skill to create its own innovations, or - analogously - on having abilities only to innovate. The more the economy and the society of a given region are innovative, the better are the perspectives to absorb capital, including highly advanced technology that may bring about large profits.

The conditions of an open economy and globalization that enable trade and investment cooperation are opportunities to accelerate knowledge based processes within developing economies by providing new knowledge resources. To implement them effectively, there is a need to conduct domestic research and development studies. Gerschenkron's hypothesis about the advantages of less developed countries because of their backwardness arises from the possibility to introduce cheaper imitations of technology invented elsewhere. This hypothesis concerns not only the benefits associated with the acceleration of economic growth, but also the process of building a knowledge-based economy. As the development gap closes, the role of imitation decreases, while the role of innovation increases (Rosati, 2007, pp. 39-45).

International technology transfer takes place in each case when technical knowledge becomes available in the country in a different way than through its own research or gathering experience. International technology transfer is referred to as a mechanism that fosters the intensification of technological changes and stimulates the innovation process. It is also called a tool for building a knowledge-based economy. However, there is one condition that should be fulfilled: the transferred technologies must positively impact the level of innovation of the entity that directly transferred this technology (Aviat and Coeurdacier, 2007, pp. 22-51).

It is estimated that in most economies, 90% of productivity growth is generated by foreign technologies (Keller, 2004, pp. 752-753). Actions to intensify the process of international technology transfer in developing economies are justified not only because of technical progress and economic growth (that foreign technologies bring) but mainly due to the effect of stimulating a country's own research and development.

A. Fosfuri, M. Motta and T. Ronde indicate a horizontal channel of international transfer in the form of migrations of qualified workers from foreign enterprises to domestic ones (Fosfuri, Motta & Ronde, 2001, pp. 205-222). Such migrations may have influence on the improvement of economic conditions for some companies or corporations.

Some researchers emphasize the importance of international mergers and acquisitions in the process of technology dispertion. Researchers define such actions as quick ways to acquire technology by technologically backward companies, and then to use this technology to create a company's own innovation and competitiveness.

To properly exploit the economic possibilities information technologies provide, there needs to be strong participation from human capital and the establishment of economic cooperation. With the import of technologically advanced goods and the establishment of production cooperation without any training, labor force migrations and *know-how* transfers are often not a sufficient source of knowledge acquisition that allows for further transformation and influence on the structure and nature of a national economy. The selection of international channels of technology transfer that permits a country to build a modern economy should take into account the importance of human capital resources in this process.

The impact of foreign companies on the increase of the technological level of local companies is mainly seen in two phenomena: the effect of competition and the effect of penetration, which occurs as a result of the effect of demonstration. Demonstration effect means that the economic entity, by introducing a new product on the market based on innovative technological solutions, simultaneously provides a significant amount of information about itself. Possess in given general information about new solutions stimulates competitors to obtain additional data needed for the creation of imitations. As a result, through imitation and reverse engineering processes, more entities acquire new knowledge. This process is additionally stimulated by the effect of competition (Lane and Milesi-Feretti, 2008, pp. 327-332). Domestic companies, in order to contend with competition from foreign enterprises, are somehow forced to raise their level of innovation.

Innovations in economic development

Innovation is an important tool for achieving the primary objective of improving the quality of life of citizens in a given country, both in the material and spiritual (immaterial) dimensions. Improvement to the quality of life can be a result of development and achievement of positive outcomes by economic entities, and can also be seen as an improvement in the operation of public administration offices (Kumar, 2006).

Innovation and learning will play an increasingly important role in the development of many economies. The source of innovation may be located both within operating companies and in their environment. The following factors can have significant impact on the innovation of the economy:

- access to different types of networks to facilitate learning opportunities, comparison of observations and exploitation of others' experience,
- the availability of support for research, in the form of publicly funded research institutes, universities interested in helping businesses or advising them with specialist knowledge–these are usually positive factors,
- the success in acquiring new technologies, leading to acceleration of structural changes.

In the modern world, the role and importance of innovative actions taken by the public sector, whose activities promote innovation among entrepreneurs and economic entities representing the private sector, is growing systematically. The result of such actions may be, for example, regional innovation systems within metropolitan regions (Ryan, 2011).

Scientific and technical progress, especially during the second half of the twentieth century, as well as the emergence of ICT and globalization, have resulted in the fact that innovation is now recognized as one of the most important sources of competitive advantage (Williams, Franic, & Dzhekova, 2014, pp. 33-45). The high rate of scientific and technological progress has allowed for the creation of advanced technologies whose further development requires considerable financial outlays, often beyond the reach of individual companies (Quinn, 2014, pp. 80-88). Therefore, an urgent need for institutional activities supporting innovativeness has recently appeared. To make these actions effective, there is a need to elaborate, develop and implement innovation strategies, such as the National Innovation Strategies (at national level) and Regional Innovation Strategies (at regional level).

Creation of Regional Innovation Strategies occurred in the 1990's as a result of actions taken by the European Union. The aim was to support innovation in the economies of the Member States and among candidate countries. The EU proposed the implementation of projects involving the development of regional innovation strategies according to certain standards.

The first EU move, indicating a strategic approach to innovation, was the creation of Regional Technology Plans. The next step was the implementation of projects called the Regional Innovation Strategies and Technology Transfer, or the Regional Innovation Strategy, which began to be implemented in 1994. A large number of parties are involved in the preparation, development, implementation and evaluation of strategies. It is said that the Regional Innovation Strategies are the first step towards the construction of innovative regions.

Regional Innovation Strategies are based on an innovation model, which also affect institutions and organizations (stakeholders) in the business environment of enterprises. The main assumption at the core of this model is that innovation is the result of an evolutionary and interactive process during which each of the 'actors' and the subsequent stages interact with each other. First, innovative ideas appear, then innovation is elaborated and implemented into production and onto the market (Metcalfe, 1995, pp. 409-420).

For the creation and implementation of innovation in organizations, the appropriate climate conducive to innovation is required (Rudzewicz, Strychalska-Rudzewicz, 2014, pp. 41-48). Each organization is a social system. Therefore, to analyze its behavior, knowledge of the behavior of social systems should be used. One of the important features of social systems is their self-organization, having the character of a process in which system components spontaneously communicate with each other and intensively cooperate in coordinating and agreeing upon common behavior. It is a political process whose aim is to develop pro-innovative attitudes and awareness in the people who form the organization (Wilkinson, 2006, pp. 99-100). Innovation is a characteristic found within people, their creativity, activity and involvement. Employees play a very important role in identifying the need for innovative changes in the management of the organization. Appropriate activities in the organization are aimed to change the attitudes of employees regarding the *status quo* as satisfactory into attitudes that accept the need for innovative changes in organization management (Seabright, 2004).

Competition is continually growing because of new technological solutions in production, distribution and market communication. More and more often, companies appear on that market that become global players from the very beginning (Beasley, Branson & Hancock, 2009). In such industries as trade, finance, information technology, or logistics, the place of registration of an activity practically does not matter – operational range may be global. In addition, strong pressure on cost reduction causes human hands to be replaced by machines (Kachaner, Lindgardt & Michael, 2011). Moreover, there is a transition from technology based on cheap energy input to technology based on low-cost information input. Access to information has no geographical borders (Czarniewski, 2014, pp. 1-8).

The management of a modern enterprise makes increasingly higher demands on managers (Casadesus-Masanell & Ricart, 2010). Strategic choices are exposed to global risk that may have its

source practically in any environment. An additional difficulty for managers is the complexity of the environment, which makes it impossible to predict the effects of decisions made. Companies can experience the paradox strategy - to a much greater extent - when the same behaviors and features maximize the probability of a major success and maximize the probability of total disaster.

Level of expenditures for innovative purposes

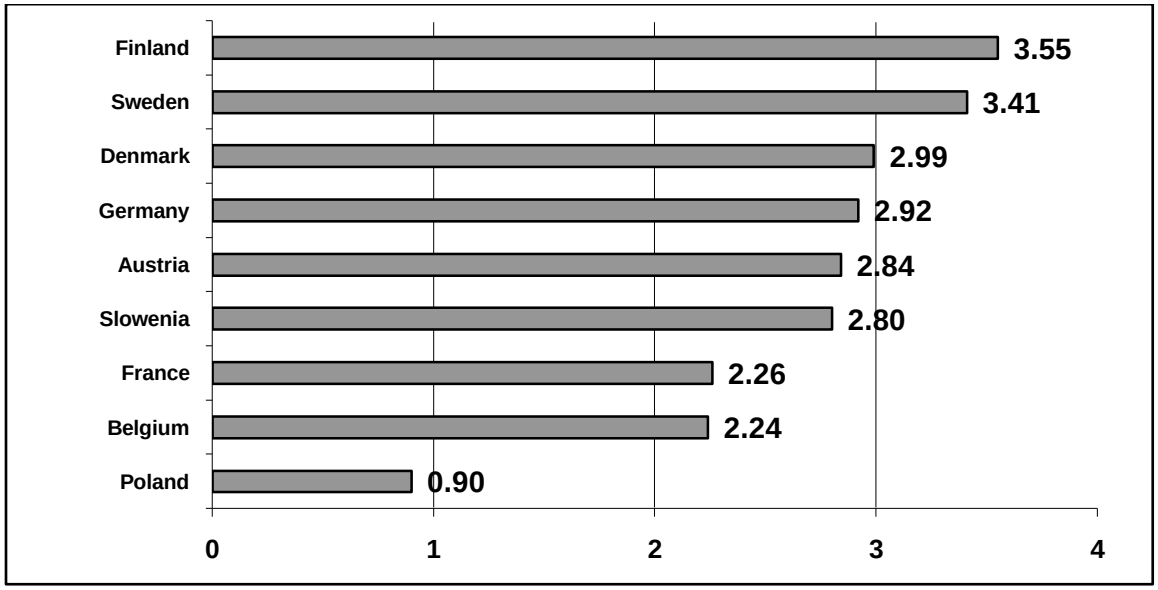
Two trends dominate the literature on the analysis of government expenditures on innovative activities (Makkonen, 2013, pp. 817-820). The first trend is of a pro-cyclical nature, where expenditures on innovative activities are reduced with the collapse of the economy, and reallocation of rather slim financial resources occurs. The second trend is of an anti-cyclical nature, where a crisis is perceived as the perfect opportunity to increase expenditure on innovative solutions. This latter approach can be explained by the conviction that in this way, the state tries to regain lost competitive advantage, and above all, to survive in difficult macroeconomic situations.

Information about domestic expenditure on research and development, which is one of the determinants of economic growth, is published every year (Figure 3). In 2012, the highest expenditures on research and development was recorded in: Finland – 3,55%, Sweden – 3,41%, Denmark – 2,99%, Germany – 2,92%, Austria - 2, 84% and Slovenia – 2,80%. Poland, with a rate of 0,9%, has a low position, occupying 18th place within European Union (out of 28 EU countries).

In the latest ranking on innovation, based on data from the years 2009 to 2012, prepared by the European Commission in 2014, Poland is a "moderate innovator" that generates innovation at approximately 50 to 90% of the EU average (unfortunately Poland ranks closer to the lower value). Innovation leaders are the Nordic countries (Finland, Sweden, Denmark) and Germany (Innovation Union Scoreboard, 2014). Perhaps a recipe for the improvement of this situation in Poland would be to strengthen the mutual cooperation of academic centers with the business sector.

Figure 3

The GERD Index (in %) in selected European countries in 2012



Note: GERD - Gross Domestic Expenditure on R&D Index determines the total domestic expenditure on research and development, carried out within the country in the reporting year.

Source: own research based on: *Gross Domestic Expenditure on R&D*, Eurostat. (2015). Retrieved January 25, 2015, from http://epp.eurostat.ec.europa.eu.

The experience of countries that achieved measurable successes in R&D activities indicate the need to appoint appropriate organizational structures (e.g. in the form of companies, foundations and associations), whose task would be, among others, to stimulate the process of the absorption of developed solutions into business practice (Czarniewski, 2015). This refers to, among others, technological parks or technology transfer offices. The scope of support offered by such institutions varies (usually it includes trainings, legal or accounting counseling, financial support in various forms), and depends primarily on the needs reported by the environment.

An indispensable way to stimulate innovation is to search for cooperation with foreign partners through the Enterprise Europe Network, whose aim is, among others, to support SMEs to develop their innovative potential (Enterprise Europe Network, 2014). The problem does not lie in the establishment of new institutions, but in ensuring that those already established have proper conditions for the effective distribution of developed innovative solutions among stakeholders.

Investments programs in selected European countries

Investments are one of the main factor of development economy, which bring short-term and long-term effects. These first result from the increase of production, that accompanies for example the construction of factory producing furniture, which leads to buying of building materials, produced by another firm. In long-term perspective, we have growth of production in completed investment, so in this case, factory begins production of furniture on national and eventually foreign market.

Investments are carried out both the public and private sector. The State invests usually in public transport or in modernization of the energy sector. In most cases these are investments, which are of strategic importance for the safety or condition of the economy. In turn, private entrepreneurs take investments, when they see an opportunity to develop production, technological modernization or restructuring. These activities always are targeted on increasing in profit for the company and introducing technological improvements to cut costs and boost efficiency. No less important is innovation, that enables competitive advantage (Szyja, 2014).

In Poland, taking into account the quantitative criteria, more investments is taken by private sector than public. However, given the size of investment projects, there are more public, because of possibilities of financing from EU funds, especially in transport. Important role in recent times played investments, connected with organization of European Championships in football in Poland – EURO 2012.

In German, after the Second World War, was established Kreditanstalt für Wiederaufbau (KfW). This institution was designed in relation to economic aid offered under the Marschall Plan for war-destroyed country. Now, KfW acts as KfW Bankengruppe. The first tasks was connected with reconstruction of German economy after war. In the second half of fifties, called “the golden fifties”, KfW involved in financing of environmental protection and SMEs, which to this day remain a part of core business. In eighties the main subject of funding was key sectors of German economy, which determine the advantages of this country in the world (KfW, 2013).

In 2002 promotional activities and commercial business was separated to increase transparency. Today, the mission of Kreditanstalt für Wiederaufbau is to encourage changes and innovative projects in German, Europe and in the whole world. The scope of activities is significant. KfW helps young people to

fund construction their own house in cooperation with private banks. In similarly way KfW encourages energy-efficient modernization of building. The financial mechanism is based on supplement the funding gap in situation taking loan from the private banks. It is worth notice, that KfW established standards of energy-efficient building - the KfW Efficiency House. Another area of interest of KfW Bankengruppe is creation and development of mikro-, small and medium-sized enterprises. KfW encourages long-term loans for various investments as well current activities. State governments can also use loans for the purpose of social housing.

KfW helps to receive capital for investments especially in structurally weak areas. It means construction like: industrial parks, roads, in building refurbishment, renewable energy. Part of KfW under the name KfW IPEX-Bank offers tailor-made financing solutions for large-scale projects. It helps German and the European export industries by financing infrastructure, climate and environmental protection projects as well as raw materials supplies. KfW takes also part in the privatization of two German enterprises: Deutsche Telekom AG and Deutsche Post AG. Bankengruppe form German supports developing and transition countries to improve their social and economical situation (KfW, 2013).

Public infrastructure projects was also included in anti-crisis plan in France, in February 2009 (Plan de reliance, 2009). The government highlighted the necessity of realization about a thousand projects in all department of the country with total guarantee amount of EUR 10 billion. From this amount EUR 4 billion allocated to investments in public companies, including rail, energy sector and postal Services. The most important are the investments in rail. The government planned four projects of high speed railway lines, including the largest - Tours-Bordeaux (LGV SEA) of 302 km of a total value of EUR 7.8 billion, including 3.2 billion package of bank loans with a tranche of EUR 1.1 billion guaranteed by the government. What is more important, this project will be implemented in cooperation with a private consortium and therefore it will receive concession for exploitation for fifty years. It was also announced the creation of a special fund, which the main task will be to invest in public company with strategic role. These investments encourage the French equivalent of a development bank - The Caisse des Dépôts. It is a institution, which operates since the nineteenth century and is long term investor in development projects in all territories.

Actually the Group of Caisse des Dépôts concentrates on projects in four areas: housing and urban development, businesses, universities and the knowledge economy, sustainable development (Our strategic priorities). In the last one field The Caisse des Dépôts takes part in funding projects connected with renewable energy, the protection of biodiversity, socially responsible investment and the fight against climate change, accelerates the development of town towards a more viable and fit to live in model: eco campuses, energy saving homes, soft mobility, etc. It is worth nothing, that two subjects of the Group: Fonds de réserve pour les retraites (FRR) i Régime additionnel de la Fonction publique (Erafp) are signatories to the document of The United Nations “The Principles for Responsible Investment (PRI). As the Group mentions, the total amount of funding sustainable infrastructure projects was EUR 4.3 billion.

In turn, the British government announced in July 2012 a new program of supporting public and private investments in infrastructure with a total guarantee limit of GBP 40 billion (Infrastructure delivery update, 2014). Projects, which will receive this help, have to meet five criteria: projects of “national importance”, projects ready to begin the construction phase within 12 months of receipt of the guarantee, financially credible, projects that without the government guarantee are likely not to obtain bankability within a reasonable period of time, projects which will have a positive impact on economic growth and do not represent an unacceptable economic or fiscal risk. The control of projects will be made by special institution The UK Guarantees Scheme. Nationally significant projects was announced in National Infrastructure Plan, which contains nearly forty investments (Infrastructure

delivery update, 2014). It is worth mentioning few: modernization of A14 road between Huntington and Cambridge, improvement of the railway networks between Manchester and Sheffield, Rochdale, Halifax, Bradford, Bolton, Preston and Blackpool, local transport projects, development of broadband Internet in big cities, renewable energy, improvement of railway to and in London.

Conclusions:

1. As a result of the constant evolution of globalization processes and transition from an industrial to information economy, the need for re-evaluation of the role production factor shave on determining socio-economic development is recognized. Modern technologies, knowledge and innovation have become fundamental determinants of sustained development, leading to prosperity – one of the overarching objectives. They are the key to the advancement of civilization and the way for countries and region store ach competitive advantage.
2. Knowledge today is an indispensable component of the process of specialization or exploitation of new technologies. Simultaneously, educated, creative and qualified personnel, which is a new quality in broadly defined human resources, not only decides about greater economic potential of a given region, but - above all - determines the speed and direction of its development and builds competitive advantage through greater ability and propensity to introduce the innovation.
3. International competitiveness of modern economies will depend on the innovativeness of their individual entities operating in public and private sectors. In this context, the growth of technological competitiveness and innovativeness of the national economy is –nowadays and in the near future – one of the most important civilizational challenges determining long-term economic growth and socio-economic development. The construction of such an economy, which is based largely on advanced technologies, innovation and knowledge, requires the activity of many sectors, including scientific activity and research and development.
4. The uniqueness of the consequences of certain economic events prevents organizations from learning and creating effective defenses for the future. For many managers, it is difficult to understand how seemingly ordinary activities can lead to unintended consequences. The difficulty of understanding the market environment by managers may be due to the way they work: they concentrate only on selected issues and are cut off from valuable information; or it may be derived from the cognitive limitations of managers - they make take hasty action, before they fully understand the implications of their actions.
5. Countries which rank last in the innovativeness of enterprises also do not invest much in R&D. Polish, Slovakian, Lithuanian, Latvian and Bulgarian companies conduct research and development activities only to a small extent, and there is overall low investment on research and development activities. In countries with greater expenditures on R&D, there are also higher shares of innovative enterprises (Germany, Belgium, Finland, Sweden).

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