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Transnational corporations and international diffusion of knowledge and technology

Abstract

The resources and skills of transnational corporations (TNC) make them play the essential role in carrying out R&D work, whose effect is the production of new, often technologically advanced solutions. Striving for maintaining competitive advantages over others on foreign markets imposes the necessity to transfer the technology worked on in parent companies to TNC foreign branches and local offices. The extensive range of TNC activity through a network of units localised in various regions of the world determines the fact that they are leaders in the process of implementing and distributing innovative solutions in the world. The main aim of the paper was to identify the scale of influence of branches of world-largest transnational corporations on entities with respect to the diffusion of technology, knowledge and skills. In this publication a descriptive and comparative methods and a domestic and foreign literature review have been used. The choice of these methods was determined primarily by the type of available research materials. It has been shown, the transfer of technology physically increases the resources of available production factors, encompassing foreign employees providing technical services or occupying managerial positions in local companies, foreign technologies contribute to the economic growth through utilizing the existing resources and that the transfer of foreign technology may cause a considerable rise in efficiency of the present factors (workforce, capital, natural resources, including land).

Keywords: foreign direct investment; transnational corporations (TNS); diffusion of knowledge; technology.

Korporacje transnarodowe i międzynarodowa dyfuzja technologii i wiedzy

Abstrakt

Posiadane zasoby i umiejętności korporacji transnarodowych (KTN) powodują, że odgrywają one fundamentalną rolę w prowadzeniu prac B+R, których efektem jest powstawanie nowych,

często zaawansowanych technologicznie rozwiązań. Dążenie do utrzymania przewag konkurencyjnych na rynkach zagranicznych wymusza z kolei konieczność transferowania technologii wypracowanych w przedsiębiorstwach macierzystych do zagranicznych filii i oddziałów KTN. Szeroki zasięg działalności KTN poprzez sieć jednostek zlokalizowanych w różnych regionach świata decyduje o tym, że są one liderami w procesie wdrażania i rozprzestrzeniania rozwiązań innowacyjnych na świecie. Głównym celem artykułu było określenie skali wpływu oddziałów największych światowych korporacji transnarodowych na podmioty w zakresie rozpowszechniania technologii, wiedzy i umiejętności. W niniejszym artykule wykorzystano opisowe metody porównawcze i przegląd literatury krajowej i zagranicznej. Wykazano między innymi, że transfer technologii fizycznie zwiększa zasoby czynników produkcyjnych, obejmujący zagranicznych pracowników świadczących usługi techniczne lub zajmujące kierownicze stanowiska w lokalnych firm, zagraniczne technologie przyczyniają się do wzrostu gospodarczego poprzez wykorzystanie istniejących zasobów oraz że transfer technologii obcych może spowodować znaczny wzrost efektywności czynników obecnych (pracowników, kapitału, zasobów naturalnych, w tym – gruntów).

Słowa kluczowe: zagraniczne inwestycje bezpośrednie; korporacje ponadnarodowe (KTN); dyfuzja wiedzy; technologia.

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Introduction

In the 21st century knowledge as well as scientific and technical thought constitute the most precious resources, and their quality determines the pace of social and economic development of both highly developed countries as well as developing and underdeveloped countries. A higher demand for knowledge in the period of globalisation is similar to the growth of demand for raw materials in the period of capitalism expansion in the 18th and 19th centuries (Antczak, 2005, p. 54). The countries which can produce, distribute and adapt knowledge faster and better have more skilled workforce, they are competitive and they note a higher pace of economic growth. However, in the world, because of many historical and economic factors, a big and still growing disproportion has emerged in the present development and its potential between highly developed countries and developing countries. Transnational corporations nowadays play a huge role in annihilating this disproportion, and they are the entities which implement and use modern technology as well as scientific and technical thought to the greatest extent.

The objective of the research done by the author of this article was to recognize the problem regarding the range and effects of cooperation between companies with a foreign capital and entities in the country of location of foreign direct investments. However the main aim of the research was to identify the scale of influence of branches of world-largest transnational corporations on domestic entities with respect to the diffusion of technology, knowledge and skills.

In deliberations related to the first four research tasks, there has been used specific and generally available reference literature, as well as empirical material originating from reports of the World Investment Report and EU Industrial R&D Investment Scoreboard. For this purpose served also the sources of foreign statistical reports from: United Nations Conference on Trade and Development (UNCTAD) and Organisation for Economic Co-operation and Development (OECD).

The article attempts to show the most important economic effects related to direct investments, which are reflected in the process of diffusion of knowledge and skills. The conducted research focused on the activities of transnational corporations, because they are the leaders in both research and development (R&D) as well as in the process of implementation and dissemination of innovative solutions in the world.

The leading significance of transnational corporations is connected with their economic power. The activity of corporations fulfils in the world economy many important functions which foster development and transformations in the global, regional and country scale. Carrying out its expansion (as regards investments, cooperation, trade), corporations cause the movement of resources and generating capacities, arouse economic growth and efficiency, they contribute to reorganisation of sectors and enterprises, activate competition and local entrepreneurship, they transmit new methods and models of management, and they also enhance international economic connections and dependencies (Kraciuk, 2006, p. 14; Alfaro, Areendam, Sebnem, & Selin 2010, pp. 242-256).

Transnational corporations – potential of innovativeness

The main feature of the contemporary world economy and one of the major subjects of the process of globalization are transnational corporations. They are very diverse companies with respect to their size, range, object, forms and methods of operation. The grounds for setting up transnational corporations on such a large scale have been excessive internationalization and globalization of production and capital, caused by transfers of capital, technology and highly-

qualified personnel carried out by the highly developed countries. The United Nations Conference on Trade and Development defines the transnational corporation as an entity being a joint-stock company or another business activity, consisting of the parent company and its affiliated foreign entities. The parent company wields control on at least 10% of stock or other shares in business entities localized outside the country of its origin. Foreign units are entities towards which the investor (the parent entity) has the right to participate in the management (UNCTAD, 2005). Transnational corporations execute the policy of territorial expansion through the engagement of their resources in the foreign direct investments. The UNCTAD differentiates three forms of direct presence of the investor's company abroad (Zaorska, 2007, p. 122): agencies with full or majority stock, mixed-ownership or affiliated companies, an agency representing the investor or being a joint-venture of a slight capital involvement (below 10%).

Among the typical features which describe the actions of transnational corporations in the contemporary economy we should pinpoint (Zaorska, 2007, p. 126-137; Marzec, 2007, p. 36):

- sovereignty – pertinent to taking strategic decisions, actions;
- complexity – covering the ownership, organizational, control and spatial;
- distribution – regarding geographical distribution, innovation and productive and commercial issues.
- specialization – selected segments of the product which is then offered in the global market;
- arbitration capacity – starting and running business activity in different markets;
- integration capacity – creating cooperation bonds;
- organizational flexibility – coordination of activities in different markets and countries;
- global efficiency – among others, expressed by conducting research in different parts of the world or executing various undertakings regarding manufacturing and sale of products.

Transnational companies through their activity affect myriad elements of the global socio-economic system. Their influence is especially visible in the following areas (Sokołowicz, 2011, p. 135):

- size, structure and directions of the capital flow,
- dissemination of technological advances on the international scale,
- structural and geographic changes in the production, consumption and the world trade;
- global distribution and redistribution of income,
- ways of using the human potential,

— organization and structure of international cooperation,

It is worth noticing that the term transnational corporations is strictly connected with the term foreign direct investments because it is the transnational corporations through which foreign direct investments are executed (Lech, 2010, p. 216). We should yet remember that transnational corporation is a broader term than foreign direct investments as it is an institutional expression of capital investment, and still production, distribution and other questions related to the direct activity in foreign markets belong to its nature.

The potential of innovativeness of contemporary TNC is affected by various factors making it possible to prepare innovations on their own and on a large scale, and, next, to introduce them to the market as the so-called global products attracting an extensive range of recipients. One should emphasise here the accumulated capital of knowledge and experience resulting from many years of TNC operation on varied foreign markets. In the period of TNC operation, appropriate innovation and patent portfolios were developed by their own personnel as well as research and development facilities (R&D). Also, new skilled were acquired which came from external sources, e.g. in the form of a licence or through entering strategic alliances, which, in consequence, made it possible to create resources of TNC key competences. A very important factor affecting the potential of innovativeness is the possibility to use one's own infrastructure of R&D works in the form of laboratories, technological and design offices, allowing quick completion of R&D projects and generation of new products and technology. Not less importance is attached to developed market skills enabling quick recognition of customers' needs and demands, and efficient management system based on high qualifications of personnel and modern information systems.

The resources and skills of TNC make them play the essential role in carrying out R&D work, whose effect is the production of new, often technologically advanced solutions. Striving for maintaining competitive advantages over others on foreign markets imposes the necessity to transfer the technology worked on in parent companies to TNC foreign branches and local offices. The extensive range of TNC activity through a network of units localised in various regions of the world determines the fact that they are leaders in the process of implementing and distributing innovative solutions in the world.

At present, one can notice a tendency consisting in the fact that the general growth of outlays for R&D works within the scope of new technology is accompanied by a decreasing contribution of one's own achievements to the knowledge resources remaining at TNC disposal. Contemporary technology is becoming more and more complex, technology

constituents are turning into subsystems, which leads to the situation in which individual enterprises, including the biggest TNC, are less often able to independently and comprehensively control a given type of technology and to use it effectively, both at the level of system and at the level of its constituents. At the same time the pressure of global competitiveness is rising which imposes the acceleration of R&D activity cycles, investment and product ones, distribution of R&D costs and risks, implementation of common technical standards etc. The above considerations lead to the discussion of the notion of “diffusion of technology” which is the object of considerations in this article.

Diffusion of technology and knowledge

Diffusion of technology is defined as a process of transferring specific knowledge from a donor’s country and, next, its application after all the necessary adaptation procedures in a recipient’s country (Figure 1). International technology transfer, however, is a process of transferring a certain technical knowledge from the country of the provider and its application in the country of the recipient once the indispensable adjustment has been made (Pomykalski, 2001, p. 45). According to L. Balcerowicz, the international transfer of technical knowledge exists when certain knowledge available in the given time in one country becomes known otherwise than totally independent research, quest, gaining experience, etc. Import of technologies and a cognitive effect connected with it is not the ultimate goal of the buyer, but only a means to manufacture new products and/or application of new methods and ways of production (Balcerowicz, 1987, p. 123). W. Nasierowski and M. Nowakowski claim, however, that the international technology transfer means acquisition, development and application of technological knowledge in any formal or informal way by a country in which the said knowledge has not been developed. Among informal methods of technology transfer, there are highlighted scientific and technological personnel exchange, technical and scientific conferences, fair and exhibitions, education and training of foreigners, trade missions and industrial espionage (Nasierowski, & Nowakowski, 1994, p. 45).

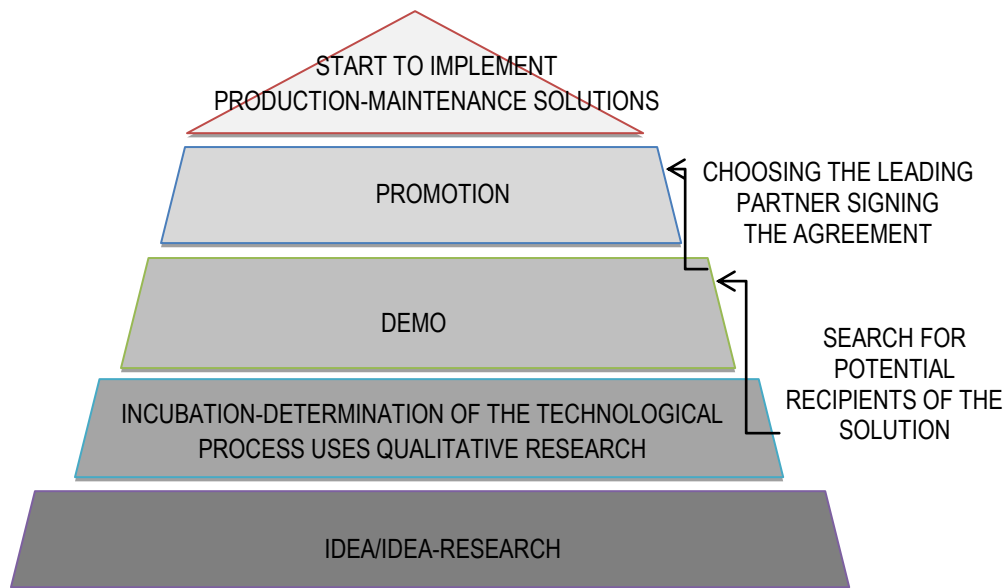


Figure 1. Stages of technology diffusion

Source: own elaboration based on the (Kijenska i Lipiec, p. 13).

It is a conscious act of using in one country material and non-material knowledge which is or was earlier applied in another country (Monkiewicz, 1981, p. 76). The transfer of technology usually takes place through a few basic channels. One should consider as such the following: foreign direct investments, trade of goods and equipment with a high content of advanced technology, licences. The transfer of technology is a relatively complex venture, requiring actions in three basic areas (Kornacka-Lątkiewicz, 2002, pp. 59-60):

- 1) recognising which advanced technology may and should be obtained, and which elements of theirs may be transferred directly, and which require additional study and adjustment actions;
- 2) adapting appropriate elements of technology subject to the transfer to the conditions of the importing system (country, entity);
- 3) creating environment conditions facilitating the assimilation of advanced technology.

These processes take place both through the market and without it. Economic practice shows that the particularised methods are not equally important. The main role is played by the market mechanism which, depending on the assumed attitude of technology suppliers, specifies possible methods of transfer (Table 1).

Table 1. Modes of transfer of technology

How to transfer	The role of technology providers	
	Active	Passive
Through the market	FDI, the purchase of a license, technological line of devices tailored to individual customer needs, technical consultation, etc.	the acquisition of standard equipment
Without going through the market	technical assistance and help the seller buyer technology	imitation, observations, analysis of business records, service in the field of technical information

Source: own elaboration based on (Wiśniewska, 2004, p. 63).

The effectiveness of a particular form of transfer depends on many factors of exogenous and endogenous nature. External factors refer to, for example, market structure (including the degree of product differentiation and type of barriers entry), technological conditioning for a specific sector functioning (consumption or investment goods) or economic policy of a country. Among the internal factors one can mention the following: scale of acting, absorption potential, financial capabilities, strategy applied etc.

Knowledge and technology may also permeate the receiving economy thanks to the mobility of the labour force, as local offices of foreign companies educate local workers who later move to local enterprises or set up their own companies, taking with them the whole knowledge acquired. This channel of spreading knowledge through foreign direct investment (FDI) seems to be quite significant, as multinational enterprises put a considerable emphasis on education and workers' training, especially in the case of technical staff and managers. This form of spreading will gain even more importance the more general vocational education of a worker provided by a multinational and the more a local company can use technology in its activity. However, as some empirical research shows, spreading of technology in this way can be more difficult if between a multinational and domestic companies there will be too big disparities at the level of technological advancement.

Knowledge spreading with FDI is enhanced also by contacts of multinational's local offices with local suppliers (these are the so-called backwards linkages or upwards linkages) or with customers (these are the so-called forward linkages or downward linkages). Suppliers can use foreign knowledge as transnational corporations often:

- help future suppliers to set up production plants,
- provide technical support and information in order to increase the quality of suppliers' products or to facilitate innovations,
- provide training and help in management and organisation,

– help suppliers to diversify through winning additional customers.

For a receiving country the scope of knowledge spreading may depend on the balance of benefits and losses of the “leak” of knowledge for a foreign investor. If potential benefits outdo potential losses, then a multinational enterprise will not constrict access of the local community to its own technology and know-how, as a result of which the degree of spreading could be greater. If, however, losses turn out to be greater than benefits, then a foreign investor will try to hinder the spreading of knowledge. Nevertheless, one should underline here that such actions aiming at impeding the diffusion of knowledge are costly.

If an investor assesses that these costs will be too high, it may decide on export activity. A potential benefit of making technology available to the local economy could be gaining technology from this receiving economy. The main motivation of investing for some enterprises is in fact the intention to access the technological strengths of a receiving economy. The second benefit of making multinational’s technology available could be joint conducting of the research and development activity with local experts. In that case not only the two-way exchange of experience and research results take place, but also the average costs of research work could be lowered. Another benefit of making technology available could be subsidies or other advantages provided by the government of a receiving country in return for the know-how of a multinational.

Whereas the main disadvantage of making technology available to local companies will be a foreign investors’ loss of some advantages, which every company should have which decides on foreign investments in the direct form, or otherwise the sense of such investments would be questioned. The loss of advantages characteristic of a multinational company thus means a decrease in future profits.

The potential of foreign technology to be used by domestic companies could be connected with the size of the **technological gap** between investing and local companies. However, it is difficult to state precisely how big this distance between an investor and a receiving economy should be. As, according to the theoretical model of R. Findlay based on the *Gershenkron* hypothesis, it is suggested that the wider the technological gap the greater the potential to acquire foreign knowledge, as a result of which the power and scope of FDI knowledge spreading can be greater. On the other hand, however, too great a technological distance between a receiving economy and an investing company may even make the absorption of foreign know-how impossible. Technologies worked on in industrialised economies may actually be discrepant with the conditions in developing countries. Furthermore, the greater

the technological gap the bigger costs and risks will have to be born by local companies in order to increase competences necessary to use the knowledge of multinational enterprises. Sometimes it may even turn out indispensable to buy a licence or to employ personnel from foreign branches, which also increases costs of using foreign knowledge. The bigger costs the less the scope of spreading knowledge by means of FDI.

The technological gap is noticeable in many areas. Comparing example measures of technology creation, one can notice how big discrepancy exists between the most developed countries of Western Europe, the USA or Japan and medium developed, especially these developed the least (Table 2).

Table 2. Examples of gauges creation technology

Average time spent in school education (years)		The recruitment rate for technical studies (in age group) in %		Foreign receipts from licenses and patents per capita (USD)		The number of patents per million residents (art)	
USA	12,1	Finland	27,3	Luxembourg	459,0	Japan	861
Greece	8,7	Bulgaria	10,9	Hungary	9,4	Latvia	41
Kuwait	6,2	Colombia	5,5	Egypt	0,7	HongKong	3,0
Kenya	4,2	Albania	2,4	China	0,1	The majority of African countries	0

Source: own elaboration based on (UNCTAD, 2014).

The investments in the research and development sector (R&D) are the most advanced form of technological activity. One should notice that transnational corporations carry out various forms of R&D works in foreign entities. These forms are the following (UNCTAD, 2005, p. 27): adaptive R&D, innovative R&D, technology monitoring.

One should notice that the most important for the countries participating in the race for foreign capital for the purpose of R&D are motives of specific decisions taken by corporations. Below there are some traditional reasons why transnational corporations move their activity abroad:

- the need to adapt products or production processes to the conditions of the host country market;
- the need to gain access to new technology and its monitoring;
- the need to access skilled labour force with indispensable abilities.

However, in order to carry out investments and develop this sector one should devote sufficiently considerable outlays and, also, have the appropriate team of specialists at one's disposal. Developed economies place approx. 2.6% of its GDP for actions in the R&D sector.

To compare: developing countries spend only approx. 0.7% of GDP, whereas in some poorest countries this share is sometimes at the level below 0.1% of GDP. One should also take into consideration the fact that GDP per capita in highly developed countries is many times higher than in developing countries.

TNC – the main source of foreign direct investments

The activity of international enterprises in the world is not evenly distributed in particular countries and sectors as well as branches of economies of host countries. On the basis of mainly Markusen's works (1995, 1998, 2002) as well as Novarotti's and Venables' ones (2006), one can make a statement of numerous empirical observations referring to various aspects of the activity of international enterprises both at the macro and micro economic level. They are made both at the level of the whole economy as well as at the level of particular branches and firms. The macro economic observations enable one to state, among others, that (Cieślik, 2005, p. 32):

- the number of foreign direct investments quickly increased in the whole world, most of all in the late 80s and 90s of the 20th century; the majority of FDI came to medium developed countries and China;
- highly developed countries are not only the source of the majority of foreign direct investments made, but they are also the main recipients;
- FDI are mostly connected with countries' similarity in respect of their relative supply in production factors or level of income per capita, and not in respect of differences among them;
- the majority of FDI is of flat nature as the majority of production generated in host countries is sold there;
- large part of the world trade constitutes the exchange taking place within international enterprises;
- the majority of empirical research indicates the existence of complementariness between international trade and FDI;
- not much research suggests that FDI are positively connected with the differences in the supply of physical capital of the home country and the host country;
- political risk, macroeconomic instability and inconsistency of the economic policy in the host country discouragingly affect making foreign direct investments there.

Whereas micro economic observations enable one to state, among others, that (Cieślak, 2005, pp. 33-34):

- two-way flow of FDI between pairs of highly developed countries takes place even at the level of branch;
- the shares of international enterprises in the size of the generated production and sales income are clearly different among particular branches;
- international enterprises play an important role in branches and firms which:
- the high value of intangible assets as compared to their market value make companies international enterprises;
- the scale benefits occurring at the level of an individual establishment do not seem negatively connected with the company internationalisation;
- there is a threshold value of the size of a company with reference to international enterprises, above which the size of this company is of no significance.

Summing up the things expressed above, one can state that the majority of FDI in the world seems to be of a flat nature and is performed among highly developed countries at similar income levels per capita, similar relative supply in production factors and possessing relatively low trade barriers. The activity of international enterprises is focused on sectors and branches where importance is attached to non-tangible assets, special for a company, referred to as the knowledge capital.

TNC – source of the transfer of knowledge and technological thought

Transnational corporations play a key role in global expenditure for research and development activity. The level of world expenses for R&D development was increasing rapidly in the last decade of the 20th century and this tendency is still maintained. These expenses are however characterised by a high level of concentration. An analysis of the biggest investors in the R&D area in 2015 indicates that the biggest business investors devote to it amounts of approx. 8 billion euros annually.

The Europeans, for many years, have been a driving force of research and development works (R&D), and they have not ceased in their actions despite the financial and economic crisis felt in the world. Since 2011 the enterprises with the seat within the territory of the EU have increased their investments in R&D up to 8.9% from 6.1% in 2010, slightly below 9% of the average value for the USA, but 1.3% over the world average, and 7.2% over the level of Japanese enterprises.

The 2015 EU R&D Scoreboard (Hernández et al., 2015) reports economic and financial information on the world's top 2500 companies that invested €607.2 billion in R&D over the last fiscal year (2014). It comprises 608 companies based in the EU, 829 companies based in the US, 360 in Japan and 703 from the rest of the world. Key findings from the 2015 *Scoreboard* include (Hernández et al., 2015, p. 5):

- in 2014, the top world 2500 R&D *Scoreboard* companies raised their R&D by 6.8%, while revenues continued to grow at a significant lower pace (2.2%);
- companies based in the EU showed an annual R&D investment growth rate of 3.3%, slightly improving the previous year's performance (2.5%). This reflects the mixed performance of medium- and high-tech sectors, e.g. good results by companies such as VW (11.7%), Ericsson (17.3%), AstraZeneca (21.4%), Bayer (13.2%), Total (42.6%) and Bosch (8.4%) have been offset by those of companies such as Nokia (-21.4%), Alstom (-29.5%), STMicroelectronics (-31.6%), GlaxoSmithKline (-10.5%), Royal Bank of Scotland (-31.5%) and Finmeccanica (-14.6%);
- companies based in the US showed a stronger R&D investment growth rate (8.1%).
- The Chinese companies, 3rd largest country by number of companies in this edition, increased R&D investments by 23.6%;
- Companies in the ICT, Pharmaceuticals and Automobiles sectors continue to dominate the top 10 places in the world ranking. As in the previous edition, the top 5 R&D investors are Volkswagen, Samsung, Microsoft, Intel and Novartis. The most significant changes at the top of the ranking in 2014 are the climb of Google to 6th place (from 9th), and of Pfizer to the 10th place (from 15th). Huawei (15th) and Apple (18th) accelerated in 2014 their race to the top, jumping 11 and 17 positions respectively;
- an analysis of the patent portfolios of the world's top R&D investors shows that EU and US companies have the highest degrees of internationalisation of their inventive activities: 26% and 22% of their patent families are developed by inventors located outside the region. While the US appear to be the preferred location for health related inventions (pharma and biotech in particular), Europe is the most attractive place for the inventive activities of automobile companies.

The top 100 companies invested €323.4 billion, accounting for 53.3% of the total R&D investment and 28.5% of the total net sales by all the 2500 Scoreboard companies. The EU has 29 companies among the top 100 R&D investors, two companies less than it had in the 2014 Scoreboard. The US has 37 companies, two more than it had last year and Japan has 16,

one company less than in last year's Scoreboard. A new company from the rest of the world entered the group of top R&D investors (Tata Motors of India, jumping from place 104 to 49).

The EU companies in the top 100 are mainly from the Automobiles & Parts (7), Pharmaceuticals & Biotechnology (5) and ICT sectors (3). The US companies are mainly from the ICT (13), Pharmaceuticals & Biotechnology (10), and Chemicals (3) sectors. The Japanese companies operate mainly in the Automobiles & Parts (4) and Pharmaceuticals(4) sectors (Hernández et al., 2015, p. 34) – Figure 2.

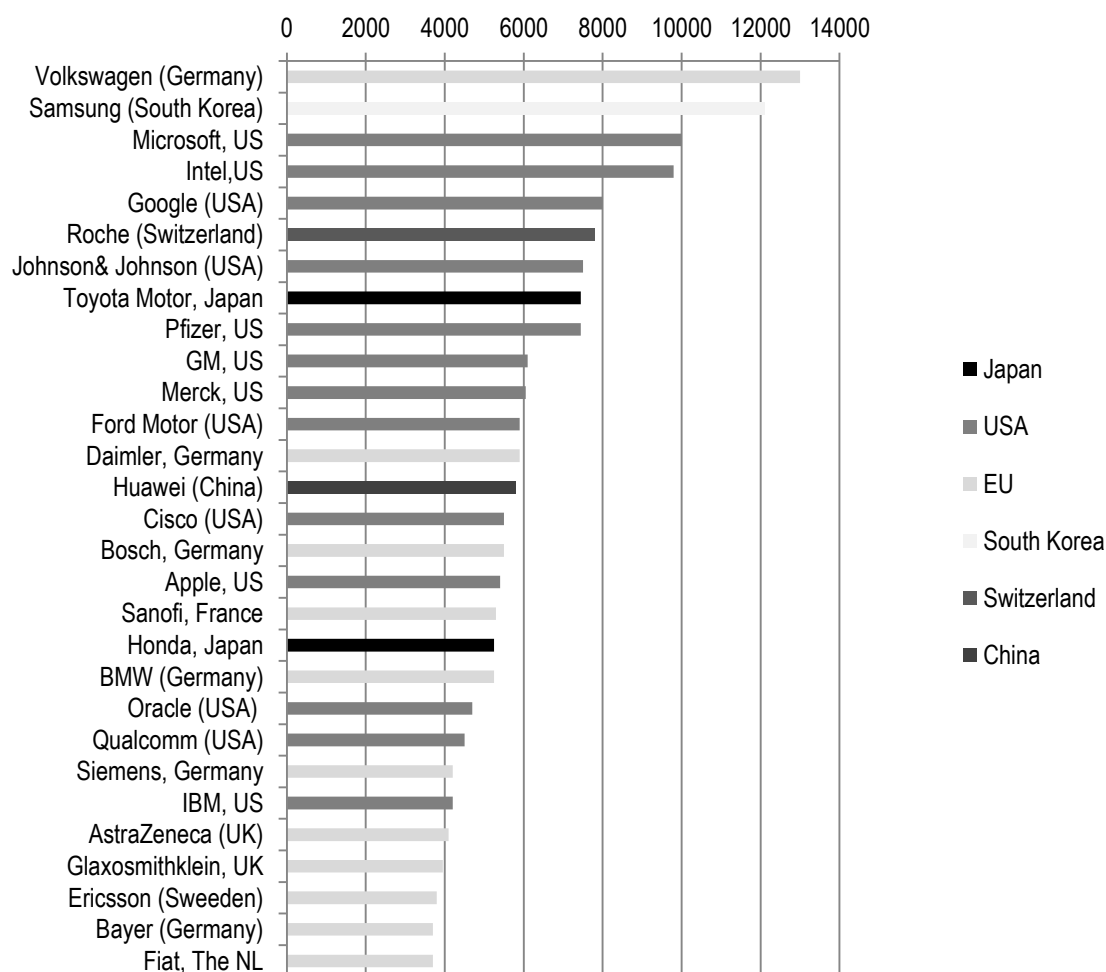


Figure 2. The largest investors in R&D in 2015 in the world

Source: (Hernández et al., 2015, p. 38).

In the group of 1500 enterprises 405 come from the UE, 503 from the USA, 296 from Japan and 296 from the remaining part of the world. One should notice here that the EU is the main place of carrying out R&D works by enterprises from the outside of its territory, and foreign investments support competitiveness and employment in the EU.

The sector division of expenditure for R&D worldwide shows that the largest share within the scope of these investments was taken up by companies from the following sectors:

pharmaceutical industry, biotechnology and advanced technology as well as motor industry. In the European Union the first position was occupied by the motor industry, and next the remaining two sectors – pharmaceutical sector and biotechnology. It is worth indicating that the high increase in investments in the whole world was noted in the case of banking sector reaching the growth indicator of 21.8%, next industrial engineering (16.5%), motor industry (13.1%). These tendencies are presented by Figure 3.

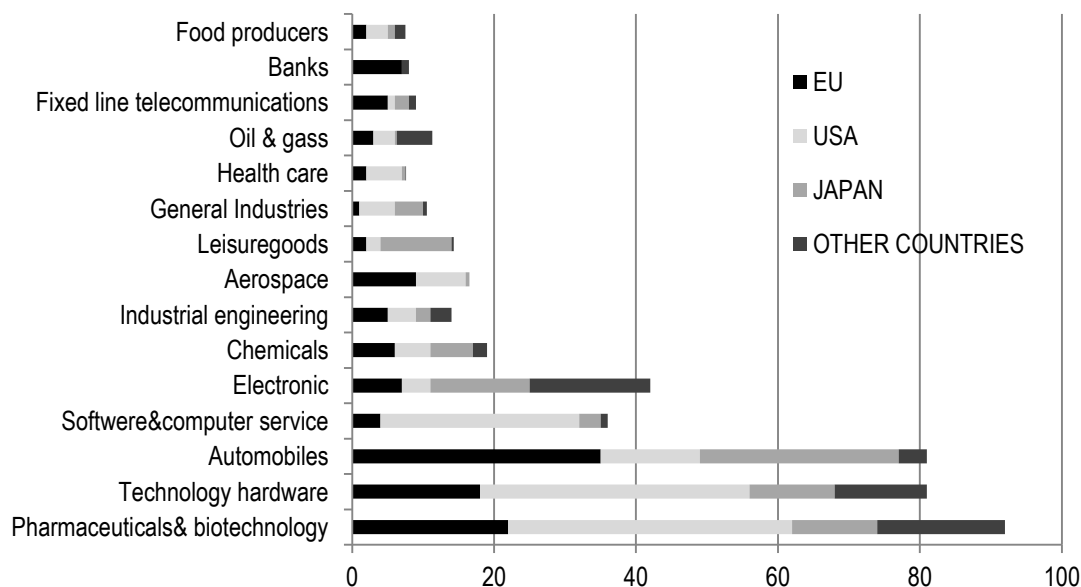


Figure 3. Ranking industrial sectors in R&D outlay (1500 companies world-wide)

Source: own elaboration based on (Hernández et al., 2015, p. 45).

One can say that two trends exist in the world when it comes to investments in R&D. The first one which can be observed in the European Union and the other one characterising the United States. Both in the first and the other region there is high concentration of big investors in R&D activity.

The present dominant position of highly developed countries: the United States, countries in the European Union (Great Britain, France, Spain, the Netherlands, Germany, Belgium, Ireland, Italy) as well as Canada and Australia, as the main recipients of capital, constitutes the reflection of their position enhancement in the world economy. The concentration of investments in the group of highly developed countries results from the evolution of the world economy towards the contemporary model based on knowledge and innovations. The progress is strictly connected with the research and development activity. Entering the new stage of development would seem to be R&D internalisation enabling the appearance among the world economy leaders of countries which will best prepare for these changes.

The significance of traditional production outlays (understood as pays of non-skilled labour force and prices of raw materials), so their share in the total cost of production is decreasing. In the present production systems the role of qualifications is rising and, thereby, the role of quality, i.e. work efficiency, less significance is attached to simple productiveness of resources.

This change is the effect of the importance being shifted in international production from the actions requiring a lot of work and raw materials (their automatisisation as a result of technological progress) to the processes requiring a lot of capital (mainly based on innovations and development of human capital). This tendency is of considerable significance for the directions of foreign investments in the future and, thereby, indicates developmental priorities of contemporary economies (Rosińska, 2006, pp. 265-279). These countries and regions which will notice and properly make use of these changes can for long years become leaders of the world economy imposing directions of its development.

Conclusions

Capital flow is accompanied with the transfer of technology, modern management and intellectual capital accomplished by foreign enterprises. M. Blomstrom, D. Konan and R. E. Lipesy (2000, p. 13) demonstrates three possible pathways of technology transfer from foreign corporations to domestic companies. First, the entry of strong high-tech leaders facilitates competition, forcing local companies to apply more efficient production methods. Multinationals may also force domestic enterprises to accelerate the implementation of new technologies, the existence of which local managers may not be aware of. Finally, the arrival of professionals and executives trained by foreign companies in domestic enterprises is an important factor in improving productivity.

It is noteworthy that the inflow of foreign direct investments is not solely limited to complement the internal accumulation of capital, but the thing that is also important, it incorporates so vital transfer of knowledge, technology, skills and managerial and organizational solutions. They are a crucial factor exerting a direct influence on companies in the country of their location, and also on the economic development of the importing country. Firstly, the transfer of technology physically increases the resources of available production factors, encompassing foreign employees providing technical services or occupying managerial positions in local companies, imported machinery and equipment, foreign raw materials, components and parts unavailable in the given country and accompanying them

contracts for the technology transfer. Secondly, foreign technologies contribute to the economic growth through utilizing the existing resources, they may create new employment opportunities for the unemployed, diminish unused potential in certain branches of economy. Lastly, the transfer of foreign technology may cause a considerable rise in efficiency of the present factors (workforce, capital, natural resources, including land) through the increase of the production volume with the unchanged volume of outlays preserves or lowering the outlays with the unchanged volume of production maintained.

The results of empirical studies on the impact of foreign investment on productivity are ambiguous. H. Georg and E. Strobl (2001, pp. F723-F739) cite twelve works on this subject, the results of which vary entirely. It turns out that the impact of the activities of foreign direct investors, increasing the productivity of industrial processing and processing industries is difficult to investigate because the external effects on domestic companies may be beneficial or not. In the case of FDI, and considering highly productive industrial processing industries, one may assume the positive relationship between the presence or activities of foreign investors and productivity, even without the existence of any external indicators. What is more, conclusions on the impact of FDI on the growth in business productivity may, to a large extent, depend on the methodology employed.

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