

TRENDS IN THE DEVELOPMENT OF TECHNOLOGY TRANSFER IN THE INTERNATIONAL ENVIRONMENT

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Abstract. The article examines the peculiarities of the transfer of innovative technologies. It was determined that strategic cooperation in the financial and production spheres of the company is not enough to ensure its competitiveness on the world market and integration into the global economic space. Attention is paid to issues of international development. The international transfer of technologies ensures the maximum return from their implementation and provides companies with the following strategic opportunities: development of the domestic market; development of new industries; adaptation and transfer of achievements of developed countries; entry into the transnational infrastructure. The directions of the development of technology transfer for various areas are presented, and it is also significant that compliance with the principles of transparency and legality of technology and equipment transfer, conscientious behavior of participants in the technology transfer market is an important factor in the further civilizational development of Ukraine.

Keywords: technology transfer, intellectual capital, international infrastructure, international cooperation, competitiveness of companies.

Intellectual capital in the international economy is considered as the main element in the competitive struggle, which ultimately determines the economic efficiency of the company's development. Modern trends in global innovative activity include the use of innovative technologies in all sectors of the national economy. The expansion of international economic ties helps to increase the pace of economic development. Research in the field of international transfer enables companies to quickly respond to new changes in economic processes and maintain their positions in international markets.

The category "international technology transfer" is new in economic science. Theoretical achievements of scientists lag behind the practices of global companies in this direction. Important results in the theory of international technology transfer were made by Keller V., Aitken B., Bransletter L., Edmonds K. The works of

different scientists show differences in the understanding of the category "international technology transfer". The impact of globalization on the world economy was studied by the following Ukrainian scientists: Vernadskyi V., Galchynskyi A., Geets V., Baranovskyi O., Vasylenko Yu., Lutsyshyn Z., Filipenko A.S. The consequences of globalization were studied by Alle M., Herst P., Thompson G., Gerda D., Stieglitz J.

The process of humanity's transition from industrial development to post-industrial development was marked by the formation of the category "globalization". Kofi Anan believes that globalization is a general term that means a complex complex of cross-border interactions between individuals, enterprises, institutions and markets, which is manifested in the expansion of commodity flows, technologies and financial funds, in the growth and strengthening of the influence of international institutions of civil society, in the global activities of transnational corporations, in the expansion of cross-border communication and information exchanges, through the Internet, in the cross-border transfer of diseases and environmental consequences, and in the interconnectedness of certain types of criminal activity.

The main feature of world economic globalization is the dominance of international relations over national ones, international standards, and norms over national ones¹⁹¹. Companies have new opportunities for development, which are accompanied by certain risks, which depend on changes in the rules of the game in the international arena. The process of globalization promotes the emergence of new competitive areas, which leads to fierce competition using traditional methods. There is a rapid increase in the number of internal competitors of the company and a gradual growth of international competitors who have great opportunities. Under such conditions, there is a need for a constant process of introducing innovations not only at the enterprise level, but on an international scale.

Strategic cooperation in the financial and production spheres of the company is not enough to ensure its competitiveness on the world market and integration into the global economic space. For the company to occupy an attractive niche in the international market, it needs to implement the process of creating new competitive advantages based on the results of innovative research. The result of the process is the implementation of competencies that are difficult for others to replicate. Competences have an intangible nature and are used in management technologies, intellectual resources of personnel¹⁹². These questions fall within the scope of a theoretical concept successfully developed in recent decades – the concept of "intellectual capital". Intellectual capital can be acquired through the implementation of strategic decisions in one's activities: improving the qualifications of employees due to the exchange of experience or personnel with leading international companies (taking courses in global business schools, internships in international companies), constant analysis of the company's existing potential, continuous monitoring of

¹⁹¹ Romaniuk I. et al. (2020). Advertising management.

¹⁹² Babko N., Kviatko T. (2020). Section 2. Financial and economic issues of society development in the turbulence conditions.

market trends trends, use of international advanced technologies and know-how in their activities.

Technology transfer is the movement of technology through various channels from one owner to another. Technology transfer refers to the international transfer of foreign scientific and technical achievements, that is, when technology created in one country is transformed into a product or process used in another country¹⁹³.

International technology transfer ensures maximum return upon its implementation and provides companies with the following strategic opportunities:

- Development of the domestic market;
- Development of new industries;
- Adaptation and transfer of achievements of developed countries;
- Entering the transnational infrastructure¹⁹⁴.

The pace of development and the efficiency of the economic circulation of technologies are determined by the participation of research institutions, enterprises and organizations in the international transfer of technologies. Indicators of countries' participation in international transfer, export and import of technologies and the dynamics of their change over time are important indicators of economic development.

The choice of methods or forms of technology transfer depends on factors:

- target purpose of the technology;
- strategy of cooperation with development partners;
- investment and technical capabilities of the company to implement the technology.

Forms of technology transfer are presented in Table 1.

Table 1. – Forms of technology transfer in international transfer

Classical	Forms contributing to the establishment of technology transfer
1. Patent agreements 2. License agreements 3. Engineering 4. "Know-how" 5. Franchising	1. Signing the license agreement 2. Joint venture 3. Strategic partnership 4. Turnkey agreement 5. Purchase of equipment or service 6. Employment of a foreign manager or expert 7. Purchase of a foreign company 8. Direct foreign investment 9. Buy backcontract 10. Original equipment

¹⁹³ Ihnatenko M., Romaniuk I., Yatsenko Y. (2021). Support of projects and strategies for the development of rural green tourism enterprises by local communities and the state, p.7-13.

¹⁹⁴ Kviatko T.M., Rudenko S.V., Mykolenko I.G. (2018). Strategic management conceptual principles of agricultural enterprises competitive behavior, p. 48-53.

The success of technology transfer depends on constant cooperation between the buyer and the technology supplier at all stages of the transfer. Companies ordering technology must establish schedules for the implementation of agreements and evaluation indicators to monitor the correct implementation of the process.

High-tech innovative companies of the European Union are equipped with the best research laboratories, which give the opportunity to own more modern developments and knowledge, and to benefit from the transfer of technologies. Based on the research of national universities, they receive new forms of knowledge thanks to close cooperation with universities from abroad. The Enterprise Europe Network (EEN) is one of the technology transfer networks operating at the EU level. The purpose of EEN's work is to establish international cooperation and spread knowledge.

The Federal Technology Transfer Act of 1986 mandates technology transfer in the United States for all scientists and engineers working in federal laboratories. This law stipulates the use of cooperative research agreements (CRADAs), according to which federal laboratories can enter partnerships with private firms at the stage of scientific research and development work. The United States of America has long been a leader in the creation and development of new technologies that contribute to understanding the world around us, solving complex problems of the competitiveness of the country's industry, and improving the quality of life in society. In the federal policy in the field of technology transfer, attention is paid to the first three stages of the transfer structure: investment, scientific research and experimental design work, intellectual property rights.

Companies and consumers involved in the prototyping, development and commercialization phases are subject to federal tax laws and regulations that affect the transfer of technology. Most universities and many research institutions are non-profit organizations. The Internal Revenue Code regulates the types of research that tax-exempt organizations typically conduct. It also regulates the terms of licensing agreements with commercial corporations. Universities are financed by issuing bonds, which is an additional limiting factor¹⁹⁵.

In Switzerland, R&D consortia seek to combine public sector research competences with the needs and expertise of the private sector to develop new products or processes. State funding is linked to the progress of the relevant work and depends on the results of the project, which are evaluated on the basis of established parameters.

Switzerland and Finland through the state policy of market reforms and using the international transfer of technologies ensured a gradual growth of technology exports and occupied the main place in the world market of high-tech products. Often, companies use the category "technological balance", which defines the international transfer of technology on a commercial basis. Technological balance is the difference between technological revenue and technological payments for

¹⁹⁵ Danko Y.I. et al. (2019). Competitiveness and price policy of Ukrainian agrarian enterprises for the production of organic products.

technology. Payments as a percentage of gross domestic R&D expenditures determine the share of imported technology in a country's R&D.

Let's analyze the situation in Ukraine. Ukraine's acquisition of the status of a candidate state for joining the EU requires the formation of a new innovative and technological strategy for the development of the state, which will enable it to make a "technological leap" despite aggression and economic troubles.

The report "Global Innovation Index – 2020" of the World Intellectual Property Organization, prepared jointly with the IN SEAD business school and Cornell University, ranks Ukraine 45th among 131 economies in the world in terms of their innovative performance (80 indicators in 7 areas). Switzerland, Sweden, and the USA lead the ranking of the leading innovative countries. Ukraine took 30th place among the countries of the European region. The basis of its innovative capacity is human capital and research.

In 2020, Ukraine ranked 56th among the 60 studied countries according to the Bloomberg Innovation Development Index. In 2020, the rating was topped by Germany, South Korea, and Singapore.

The European Innovation Scoreboard provides a comparative assessment of the strengths and weaknesses of the innovation systems of 27 EU member states and 10 neighboring countries, including Ukraine. The report of the European Innovation Scoreboard – 2020 classifies Ukraine among the countries of "slow innovators" (outsiders). Ukraine's strengths are high rates of broadband penetration, employment in science-intensive activities, spending on innovations not related to research and development, and exports of science-intensive services.

The strategic goal of forming a highly developed socially oriented economy in Ukraine, based on innovation and innovation, is provided by the National Economic Strategy of Ukraine for the period until 2030, approved by the resolution of the Cabinet of Ministers of Ukraine on March 3, 2021, the plan of measures for the implementation of the Association Agreement between Ukraine and the European Union, by the European Atomic Energy Community and their member states, approved by Resolution No. 1106 of the Cabinet of Ministers of Ukraine dated October 25, 2017.

Ukraine's competitive position is unstable. The war with Russia led to the loss of a significant part of the industrial and investment potential of our state, and significant migration led to the reformation of the human potential of the state. At the same time, financial and technological assistance to Ukraine from the USA and the EU was the result of a significant breakthrough in the field of technology transfer. For the first time in its history, Ukraine gained access to the most modern medical, military, defense and dual purpose technologies and developments. This transfer takes place at the level of states and under state guarantees.

The extraordinary circumstances of Russian aggression forced states and governments to look for new ways of transferring equipment and technologies.

Ukraine has a chance not only to protect its independence and territorial integrity, but also to make an innovative leap in the development of its economy. Ukraine needs significant efforts on the part of international partners and the state. The issue of creating new industries and joint ventures, whose activities are aimed at restoring and improving equipment and machinery, as well as the use of defense technology assets in civilian life, are relevant. An important aspect is access to the latest technologies in the medical field: ophthalmology, orthopedics, and reconstructive and restorative medicine.

Compliance with the principles of transparency and legality of technology and equipment transfer, conscientious behavior of participants in the technology transfer market is an important factor in the further civilizational development of our country. In this sense, it is worth paying attention to the specifics of the development of international legal regulation of technology transfer, guarantees and restrictions contained in Ukraine's international obligations.

A feature of the modern stage of development of international technology transfer is that transnational corporations actively involve their foreign branches, scientific centers, and laboratories in conducting scientific research activities. The use of intra-corporate technology exchange is one of the means of foreign economic expansion. The main channel for the implementation of this policy of transnational corporations is the transfer of licenses to their own branches and subsidiaries at transfer prices, that is, the provision of new achievements on preferential terms. Licenses enable multinational corporations to set up production of competitive goods at private enterprises and sell them in the states where they operate. As a result, multinational corporations get the opportunity not only to minimize the costs and time of development of the invention, but also to avoid customs barriers and currency restrictions of other countries. About 2/3 of the total value of international agreements with objects of intellectual property, according to experts, are agreements between affiliated corporate structures, which indicates the predominance of concerted actions and economic concentrations in the international trade of objects of intellectual property. In 1978, the UN Commission on International Trade Law began to consider the unification of the rules of international technology transfer, along with questions about transnational corporations, restrictive business practices, the elimination of discrimination in trade and the obligation to cooperate in trade relations. Later, this commission decided to consider the issue of unification of rules regulating the transfer of technology together with contractual provisions in the field of industrial development. One of the arguments in favor of the inclusion of provisions on the transfer of technologies in the legal guidance on the construction of industrial facilities was that the transfer of technologies is a necessary element of providing assistance to the customer in the operation of the enterprise and its maintenance. The issue of counteracting restrictive business practices in many aspects in Ukrainian legislation is defined and unified in relation to European

requirements, but the issue of technology transfer to the customer as assistance in the operation of the enterprise and its maintenance remains unresolved. Even the norms adapted to Ukrainian legislation regarding the control of economic concentration processes do not provide for specific rules that ensure the protection of economic competition regarding the use of technology transfer as an effective mechanism for gaining control over the market of relevant goods, works or services. For example, amendments to the Law of Ukraine "On the Protection of Economic Competition" on improving the efficiency of the control system over economic concentrations are aimed at implementing the provisions of Article 256 "Approximation of legislation and application practice" of the Association Agreement between Ukraine and the European Union, which provides, in particular, the need to implement Articles 1 and 5 (1)-(2) of Council Regulation (EC) No. 139/2004 of January 20, 2004 on control over the concentration of business entities and the implementation of the provisions of clause 73 of the Action Plan on deregulation of economic activity and simplification of the regulatory framework, which provided for a review of the system of value indicators, for the achievement of which it is necessary to obtain the permission of the Antimonopoly Committee of Ukraine for concentration, in particular, in terms of increasing their values and taking into account the impact of concentration on competition in Ukraine, based on the OECD Recommendations, the Recommendations of the International Competition Network on the construction of an effective, efficient and fast system control by economic concentrations, but do not provide mechanisms for countering economic concentration (M&A) using technology transfer mechanisms. Achieving the relevant evaluation indicators is extremely illusory; however, the processes of concentration in the Ukrainian market did not stop even the war, although we can observe a gradual flow of transactions to other jurisdictions with a more loyal tax and control regime.

M&A activity observed in the biopharmaceutical industry of both original drug manufacturers and genetics manufacturers. Mergers often involve multiple countries, as companies in this industry are more globalized, with an emphasis on growth in emerging markets. In countries with a medium and low level of economic development, there has been monopolization of local enterprises by multinational companies, targeted acquisition of local firms by multinational corporations (for example, Sanofi's acquisition of Medley in Brazil), as well as mergers of local firms. Prior notification of the merger to the antimonopoly authorities of each country should be the norm because the geographical boundaries of drug markets are defined as national borders. Prior notification enables each national authority to assess the impact of the merger on the level of concentration in the relevant markets, with the requirement to identify dominant drugs and, if necessary, to prevent unjustified increases in the level of concentration. An important policy issue is the determination of the threshold value of the M&A volume: in proportion to the country's GDP or to the volume of sales of medicines during prior notification. In recent years, the US has

expanded its prior notification requirements for licensing agreements, demonstrating the importance of licensing agreements as a form of acquisition in the pharmaceutical industry.

According to the fourth part of Article 256 of the Association Agreement between Ukraine and the EU, Ukraine must implement Articles 1-8 of EU Regulation No. 772/2004 of April 30, 2004, on the application of Article 81(3) of the Treaty establishing the EU to categories of technology transfer agreements. This regulation is no longer valid and relevant issues are regulated by EU Regulation No. 316/2014 of March 21, 2014, on the application of Article 101(3) of the Treaty on the Functioning of the EU to categories of technology transfer agreements (Regulation).

An important condition for the application of the rules is the purpose of the agreement – the production of goods using the transferred intellectual property rights. The rules do not apply to joint research and development (R&D) and supply contracts. At the same time, the rules apply to the provisions of technology transfer agreements governing the purchase of goods by the licensee and the transfer of all related intellectual property rights necessary for the production or sale of contract goods.

According to the rules, agreements on the transfer of technologies will be considered legal and will not require obtaining the permission of the Antimonopoly Committee of Ukraine, if they are concluded between competing business entities and their combined share in this market does not exceed 20%, as well as if they are concluded between business entities, that are not competitors, the market share of each participant does not exceed 30%.

These rules do not apply to technology transfer agreements that contain certain hardcore restrictions: limiting the ability of one of the parties to determine their prices during the sale of goods to third parties; production restrictions; distribution of markets according to territorial characteristics, assortment or circle of customers (consumers); limiting the ability of the licensee to use its rights to the technology or limiting the ability of any party to carry out research and design work.

In some cases, antitrust authorities may not apply the rules to technology transfer agreements. This may be related to the market research conducted by the Antimonopoly Committee of Ukraine, because of which it was established that technology transfer agreements in this market will limit competition and will not lead to positive consequences. Standard requirements for concerted actions of business entities in the field of technology transfer, compliance with which allows for concerted actions without the permission of the Committee bodies, do not apply to multilateral agreements and industrial cooperation agreements.

The development of technology transfer and innovation in the EU is not limited to international contractual obligations, regulations, and directives. The basis of technology transfer in the EU is the creation and operation of framework research programs open to external participants. The programs are tools for promoting the

scientific and technological progress of countries and correlate EU strategies in the field of promoting the development of culture, science, and education on a global scale. The EU allocates resources to promote the development and transfer of technologies. The legal foundations of cooperation in the field of science and technology are contained in the agreements on partnership and cooperation of the EU with third countries, as well as in agreements on associate membership.

Adherence to the principles of transparency and legality of technology and equipment transfer, good faith behavior of participants in the technology transfer market is an important factor in the further civilization development of Ukraine. The state should pay attention to the specifics of the development of international legal regulation of technology transfer, guarantees and restrictions contained in Ukraine's international obligations. Because even the norms of European directives and regulations implemented in Ukrainian legislation are not a guarantee of the development of honest and transparent technological exchange and technology transfer. Procedures for public procurement of innovative products, holding creative competitions for scientific developments (regulated by Directive 2014/24/EU and Directive 2014/23/EU), and multilateral agreements on the transfer of technologies and scientific developments that are insufficiently regulated by current legislation remain unsettled.

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