

Global Forms and Mechanisms for Transnationalization of Market of Intellectual Property Items*

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ABSTRACT. The paper studies present-day processes of transnationalization of world market of intellectual property items (IPI) in complex; it determines their mechanisms and evaluates impact on parameters of innovative and technological safety of countries and regions. Role of transnational corporations in the international technology exchange is revealed, and their competitive positions at the world IPI market are analyzed. Global character of monopolization of intellectual property market is justified, as well as key directions of upgrade of technology policy of transnational structures in terms of enhancement of their innovative leadership. Significant amount of attention is paid to analysis of operations of cross-border strategic alliances as one of institutional forms of build-up of corporate patent portfolios and enhancement of competitive positions of transnational corporations at the world intellectual property market.

It is proved that in order to maintain steady competitive advantages at the IPI global market the majority of transnational corporations actively monitors emergence of new technology just at the initial stage of fundamental research, thus deepening the interstate innovative and technological gap even under the technoglobalism.

KEYWORDS. Global market of intellectual property items, transnationalization, technoglobalism, international technology exchange, innovation patenting, trademarks, corporate strategy, technology policy, cross-border strategic alliances, venture investment, technology safety.

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Introduction

Globalization stage of world economic development of early 21st century is mainly characterized by comprehensive post-industrialization of capitalist market system, positioning of the knowledge economy at the world level, vigorous build-up of transnationalization tendencies in development of national economies and gradual formation of common planetary currency and financial, informational and communicational, and innovative and technological space. Under such circumstances innovation factors play the key part in ensuring the international competitiveness of economic entities, namely, such factors' capacity to generate high-tech goods and intellectual property items (IPI). These are the Western transnational companies that are now the most powerful driving force of development of world progress and interstate innovation exchange due to large-scale R&D funding, mass launch of innovation techniques in manufacturing, and ensuring operational commercialization of academic development and efficient transfer of high technology.

Studies of production intellectualization processes, transnationalization of international academic technology exchange, formation of world market of intellectual property items, diversification of global competitive environment, mechanisms of ensuring competitive leadership of transnational companies at world markets, matters of intellectual property protection have been subject to works of such Ukrainian and foreign scholars, as Androshchuk H.², Antoniuk L.³, Aho M.⁴, Allison J.⁵, Arora A.⁶, Vallie V.⁷, Gallini N.⁸, Daniel E.⁹, Jaffe A.¹⁰, Jorgenson D.¹¹, Kondratiev

² White book. Intellectual property in innovation economy of Ukraine / Androshchuk H.O., Demianenko O.V., Zhyliaiev I.B., et al – K.: Parliament Publishing House, 2008. [In Ukrainian].

³ Antoniuk L.L. International Competitiveness of countries: theory and implementation mechanism: article thesis. – K.: KNEU, 2004. [In Ukrainian].

⁴ Aho M., Rosen H. Trends in Technology-Intensive Trade // Economic Discussion Paper 9. – Washington US Department of Labor. – Bureau of International Labor Affairs. – October 1980.

⁵ Allison J., Lemley M. Who's patenting what? An empirical exploration of patent prosecution. // Vanderbilt Law Review. – 2000.

⁶ Arora A., Fosfuri A., Garbardella A. Markets for Technology: The Economics of Innovation and Corporate Strategy. – Cambridge, Massachusetts / London, England: The MIT Press, 2001.

⁷ Vallie V. Paradoxes of intellectual property right / Vallie V. – Kyiv: Education of Ukraine, 2010. – 420 p. [In Ukrainian].

⁸ Gallini N. The economics of patents: Lessons from recent U.S. patent reform. // Journal of Economic Perspectives 16 (2). – 2002.

⁹ Daniel E. Hecker High-technology employment: a NAICS-based update, July 2005. – Vol. 128. – No. 7. – pp.57-72.

¹⁰ Jaffe A. The U.S. patent system in transition: Policy innovation and the innovation process. // Research Policy 31.

¹¹ Jorgenson D., Vu K. Information Technology and the World Economy // Scandinavian Journal of Economics. – 2005. – V. 107. – No. 4. – pp. 631-650.

V.¹², Kelly R.¹³, Lukianenko D.¹⁴, MacMillan I.¹⁵, Machlup F.¹⁶, Polokhalo V.¹⁷, Poruchnyk A.¹⁸, Khaustov V.¹⁹, Fedulova L.²⁰ and many others. Along with that, issues related to study of global forms and mechanisms of intellectual property market transnationalization still remain insufficiently developed in academic literature, as well as matters of identification of directions of upgrade of technological policy of transnational companies under conditions of technical globalism and escalating competition for the world intellectual and innovative resource. This is what justifies relevance of this paper.

Role of Transnational Companies in International Technology Transfer

In modern processes of international technology transfer and formation of global IP market the systemic transnationalization of national economies plays the leading part, such transnationalization having obtained the global shape at the beginning of the third millennium and gets concentrated expression in constantly increasing scales of operation of transnational companies. It is enough to say that in global terms the transnationalization sector controls about 80% patents and licenses to inventions, new technology, and know how. In particular, in the US the share of corporate patenting is almost 85% of total number of patents granted in the country. However, the peculiarity of R&D corporate funding is in its high efficiency, since virtually all expenses are fully transformed in patents – the form of intellectual indus-

¹² Kondratiev V. Corporate sector and state in strategy of global competitiveness / Kondratiev V. // MEiMO. – 2009. - No. 3. –pp. 24-31. [In Russian].

¹³ Kelly R. Research and Development in USA. Trade in Manufactures. Paper prepared for International Economics Course, George Washington University, 1974.; Kelly R. The Impact of Technological Innovation on International Trade Patterns. – Staff Economic report. – Washington. – US Department of Commerce. – Office of Economic Research. – December 1977.

¹⁴ Resources and models of global economic growth: article thesis / Lukianenko D.H., Poruchnyk A.M., Kolot A.M., Stoliarchuk I.A. et al; generally edited by Lukianenko D.H. and Poruchnyk A.M. – K.: KNEU, 2011. – 703 p. [In Ukrainian].

¹⁵ Corporate Innovation and Strategic Growth. Recent patterns in CVC mission, structure and investment. By Ian MacMillan, Edward Roberts. Val Livada, Andrew Wang. National Institute of Standards and Technology. US Department of Commerce, June 2008. – 38 p.

¹⁶ Machlup F. Knowledge Production and Occupational Structure. Cortada J.W. Rise of the Knowledge Worker. – Boston. – Oxford, 1998.

¹⁷ Intellectual property in formation of innovation economy of Ukraine: problems of legislative support and government regulation / Generally edited by Prof. Polokhalo V.I. Compiled by: Androshchuk H.O. — K: Parliament Publishing House, 2010. [In Ukrainian].

¹⁸ Global economic growth: trends, asymmetries, regulation: article thesis / Compiled by Lukianenko D., Poruchnyk A., Kolesov V. – K.: KNEU, 2013. [In Russian].

¹⁹ Khaustov V.K. System of industrial property protection in the Republic of Belarus and Ukraine / Khaustov V.K. // Economy and forecasting. – 2011. – No. 1. – pp. 74-84. [In Ukrainian].

²⁰ Fedulova L.I. Methodological principles of technology clusters formation / Fedulova L.I. // Economy and forecasting. – 2010. – No. 3. – pp. 61-73. [In Ukrainian].

trial value able to generate innovations.

The extreme importance of transnational entities in the international technology transfer and rise of global IP market is also supported by total worth of innovation costs of world biggest transnational corporations which now are significantly higher than R&D expenses of many countries of the world. Thus, aggregate innovation costs of 100 corporations incurring the highest innovation costs were USD 208.7 billion in 2013. However, for the said period American companies spent the total of USD 453.5 billion on the R&D (where the share of innovation-active companies in production is about 70%), Japanese companies – 148.4 billion (77%), French companies – 54.7 billion (64%), and British companies – 39.1 billion (64%), respectively²¹.

It should also be emphasized that in terms of industry the highest intensity of R&D is now specific for chemical, pharmaceutical companies, auto manufacturers, as well as for companies operating in electronic industry. This basically reflects specifics of modern industry structure of monopolization of global IP market, which is focused on fixation of corporate structures' dominant position in the most intelligence intense productions with the biggest added value. This is also supported by rating of Thomson Reuters – Top-100 most innovative companies of the world, according to which based on 2014 the TOP 10 global leaders include such companies, as 3M Company (chemical industry, US), ABB (industrial sector, Switzerland), Abbott Laboratories (pharmaceuticals, US), Advanced Micro Devices" (half-conductors and electronic components, US), Aisin Selki (auto manufacturing, Japan), Alcatel-Lucent (telecommunications and equipment, France), Altera (half-conductors and electronic components, US), Apple (telecommunications and equipment, US), Arkema (chemical industry, France) and Asahi Glass (industrial sector, Japan)²². For instance, in the UK the key player in IT domain is Advanced RISC Machine, which similarly to other Cambridge companies spinned-off Acorn Companies. This spin-off company was established in 1990 resulting from cooperation of IT giants – Acorn and Apple Computer in development and commercialization of new standards of microprocessors. As for now, Advanced RISC Machine ranks first in the world as the intellectual property supplier in area of half-conductors. Another British

²¹ Thomson Reuters 2014 Top 100 Global Innovators. Honoring the World Leaders in Innovation. Finding and Methodology, November 2014. – P. 6.

²² Thomson Reuters 2014 Top 100 Global Innovators. Honoring the World Leaders in Innovation. Finding and Methodology, November 2014. – P. 8.

company, Cambridge Silicon Radio is also the spin-off from Cambridge Consultants which was organized in 1960 by alumni of Cambridge University with the goal "to focus the University brains on settlement of British economy problems"²³.

High attention paid by transnational entities to patenting of their inventions is justified by the same logics of their technology policy oriented on maintenance of leading positions at the high-tech segment of global market. In support of that idea an example can be given, namely, that of Polaroid and Kodak companies. Their large-scale patenting of innovations merely ensured their leadership at the world market of photo goods. To that effect it should also be mentioned that Kodak's founder, George Eastman, received his first patent to invention in photo industry 60 years earlier than Edwin Land. One more company, Qualcomm specializing in telecommunication already in 1992 patented the technology of use of radio-frequency spectrum by mobile phones and other devices of mobile connection which is known as CDMA. That resulted in its annual income from production of own goods and licensing rights to CDMA use to other companies being estimated USD 3 billion, including USD 800 million of royalties under licensing agreements²⁴.

Without patenting of gene engineering technology current positions of Biogen at the world pharmaceutical market would be impossible as well. For past decades it's being actively transferring rights to its patents to other pharmaceutical corporations, at the same time commercializing its inventions and receiving huge income as royalty. Such examples may go on.

As it appears from Table 1, among transnational corporations mostly represented at the global patent market today, the world leaders are such transnational corporations as ZTE Corporation, Panasonic Corporation, Huawei Technologies, Sharp Kabushiki Kaisha, Robert Bosch Corporation, Qualcomm Incorporated, and Toyota Jidosha Kabushiki Kaisha. However, it's interesting to notice that they mainly present the world electronic and auto manufacturing industry, and TOP 5 companies today include two Chinese transnational corporations which demonstrate the highest rates of increase of number of patents received within years 2009-2011.

²³ Chernomorova T. Regional innovation policy of the UK / Chernomorova T. // MEiMO. – 2012. – No. 4. – P. 103. [In Russian].

²⁴ Vallie V. Paradoxes of intellectual property right / Vallie V. – Kyiv: Education of Ukraine, 2010. – P. 197.

Table 1 Top – 10 corporations based on number of submitted applications for patents under the PCT procedure throughout years 2009-2013²⁵

| Ranking in 2013 | Applicant corporation | Country of origin | Applications published for patents received under the PCT procedure | | | Change of 2013 versus 2009 |
|--------------------|-------------------------------|-------------------|---|-------|-------|----------------------------|
| | | | 2009 | 2011 | 2013 | |
| 1 | Panasonic Corporation | Japan | 1891 | 2463 | 2839 | 948 |
| 2 | ZTE Corporation | China | 517 | 2826 | 2309 | 1792 |
| 3 | Huawei Technologies Co., LTD. | China | 1847 | 1831 | 2110 | 263 |
| 4 | Qualcomm Incorporated | USA | 1280 | 1494 | 2050 | 770 |
| 5 | Intel | USA | ... | ... | 1871 | x |
| 6 | Sharp Kabushiki Kaisha | Japan | 997 | 1755 | 1839 | 842 |
| 7 | Robert Bosch Corporation | Germany | 1588 | 1518 | 1809 | 221 |
| 8 | Toyota Jidosha | Japan | 1068 | 1417 | 1698 | 630 |
| 9 | Telefonaktiebolaget Ericsson | Sweden | 1241 | 1116 | 1468 | 227 |
| 10 | Philips Electronics | Netherlands | 1295 | 1148 | 1423 | 128 |
| Total for TOP – 10 | | | 12814 | 16904 | 20884 | 8070 |

Slightly different situated is observed in corporate distribution of global market of trademarks. It is generally known, that the Madrid system enables applications to register the same trademark in many countries of the world when they file the international application to the national or regional IP department being member of the Madrid system. In other words, due to unification of procedures of trademark registration it significantly eases the process of multinational registration thereof for the transnational corporations as well as it simplifies penetration to markets of virtually all countries of the world. Considering the fact that these are pharmaceutical companies that are leaders in trademark registration at the IP market, such companies having enormous R&D

²⁵ Calculated and built by authors based on: WIPO IP in facts and figures 2012. WIPO Economics & Statistics Series, 2012. – P. 19. WIPO IP in facts and figures 2014. WIPO Economics & Statistics Series, 2014. – P. 16.

budgets and having the commercial activity which is mainly of the global character due to requirements of registration of their trademarks in hosting countries when obtaining the permission for sale of the medicinal product. They include but are not limited to the following: Swiss Novartis AG, Czech Zentiva Group, Hungarian Egis Gyogyszergyar, German Boehringer Ingelheim Pharma GMBH, and Icelandic Actavis Group which filed 650 applications for trademark registration all over the world in total in 2013 (Fig. 1).

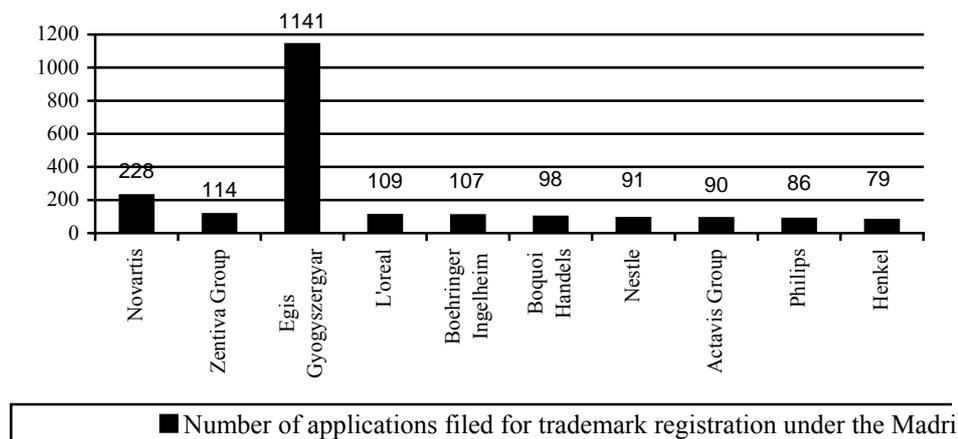


Fig. 1. Total number of applications the companies filed for registration of trademarks under the Madrid system in 2013²⁶

In order to preserve their stable competitive advantages at the IP global market the prevailing majority of transnational corporations actively monitors occurrence of new technologies at the mere initial stage of fundamental research. This explains the dominant part of intellectual capital in figures of cumulative capitalization of an average high-tech company which reaches 85%²⁷ today. Furthermore, based on results of corporate innovative development and experimental study relevant standards and rules of licensing are formed at the international level, within which all the products are manufactured which come to the specific segment of the global market.

²⁶ WIPO IP in facts and figures 2014. WIPO Economics & Statistics Series, 2014. – P. 27.

²⁷ Strategy of innovation development of Ukraine for years 2010-2012 under condition of globalization challenges / Compiled by H.O. Androshchuk, I.B. Zhyliaiev, B.H. Chyzhevskiyi, M.M. Shevchenko. – K.: Parliamentary Publishing House, 2009. – P. 290. [In Ukrainian].

Competitive positions of transnational corporations at the IP global market

Being the basis of modern technological micro-integration responding to global challenges in a timely manner leading transnational corporations of the world constantly upgrade organizational forms of their activities, gradually going from strict hierarchy to models of flexible horizontal organization of commercial production and financial activity. As seen from the international business practice, the highest efficiency among them is now demonstrated by strategic alliances established in science-intense areas of economy where dynamic development of innovation processes significantly restricts possibilities of separate corporation to conduct large-scale research and development alone, not to mention comprehensive development of fundamental science.

Cross-border strategic alliances are one of the efficient institutional forms of increase of corporate portfolio of patents and enhancement of the transnational corporations' competitive positions at the world IP market. And this is nothing if not on purpose, since tools of licensing and direct investment do not always allow getting the sufficient number of patents. Therefore, this is formation of cross-border strategic alliances that allows companies to unite their patent portfolios, get fast access to international technology and markets, minimize risks related to technology development, and thus getting the monopoly right to operate in the specified sector of economy.

The significant part of cross-border strategic alliances in modern processes of IP international exchange is evident from the fact that as of today the total number of such entities in the world is about 70% of total number of strategic alliances formed. Thus, the most successful examples of such alliances include, inter alia, includes the strategic alliance involving Xerox and Fuji Xerox in domain of copying technology development, copying equipment marketing in the US and Asian countries, development of technology of printers production and sale thereof at international market; Honeywell and Yamatake-Honeywell – in research and development of checkout equipment and expansion of sales of checkout equipment in Japan; Hewlett-Packard and Yokogawa-HP – in expansion of sales of computers in Japan and research and development of equipment for control over half-conductors; Fujitsu and Amdahl – in sales of compatible devices in the US

and development of technology of production of general purpose computers; IBM and Toshiba – in research, development of technology, and production of flat screens²⁸. Similar examples may go and go. Therefore, there are all reasons to state that deepening of inter-corporate cooperation in the R&D area through mechanisms of strategic alliances for past decades has gone beyond national borders having formed qualitatively new mechanisms of in-ternational technology transfer and institutionalization of global IP market.

The important "channel" of multidimensional impact of transnational corporations on global IP market is their active participation in venture capital financing. This is their corporation with minor and mid-size companies in development and commercial deployment of innovative products, large-scale funding of small "innovative" firms by transnational corporations and banks, as well as emergence of new high-tech areas of economy which became key factors of activation of venture companies' operations.

As one of key components of institutional mechanism of ensuring commercialization of innovations at the international level, venture investment of corporate sector is now aimed at strengthening of global corporate leadership of transnational corporations based on meeting the consumers' demand in new products, higher technology level of production and implementation of efficient mechanisms of academic support thereof.

Having tremendous financial resources and extensive branch networks, transnational corporation have even more advantages in modern processes of venture capital financing in comparison with localized investment companies. To that effect, Head of Venture Investment Department of EY Bryan Pierce quite has the point saying that, "corporate sector today searches for ways to overcome innovation gap based on venture capital financing to pioneer new innovation directions, and governments of many counties get more and more "involved" in build-up of business ecosystems with flourishing venture capital financing"²⁹.

High efficiency of corporate venture capital financing of innovation is evident from that fact that already in 1960 almost one third of 500 corporations on the Fortune rating widely applied

²⁸ Babina A. International strategic alliances // Bankauski Vesnik, Katrychnik 2007. [Electronic resource]. – Access mode: <http://www.nbrb.by/bv/narch/393/8.pdf>. [In Russian].

²⁹ Adapting and Evolving. Global venture capital insights and trends 2014. – EY, 2014. – P. 1.

venture mechanisms of innovation commercialization³⁰. Among the most successful innovation projects that were implemented at that time and were supported by venture capitalism financing projects should be mentioned which were implemented on base of such corporations as Apple, Cisco, Compaq, e-Bay, Google, HP, Intel, Microsoft, and Sun Microsystems, due to which such firms received billions of income for a relatively short period.

However, large transnational corporations normally request the significant part of innovation development from minor innovation entities resulting in much higher efficiency of academic search and ensuring high tempo of innovation commercialization. Thus, in the age of information revolution, using financial support from the corporate venture capital such leading technologies and areas reached high growth rate as information and communication technology, gene engineering and automated management systems, air and space industry and defense, chemical industry, energy, medicine, biotechnology, and pharmaceuticals. These are the industries which today are the most perspective in terms of corporate capital investment in R&D according to experts of Battelle – R&D Magazine³¹.

Besides, as evident from studies of American experts conducted with respect to 530 Massachusetts companies, firms supported by venture capital today demonstrate significantly higher patenting figures versus companies which raised no venture capital financing. In particular, experts' opinions show that 1 dollar of venture investment in R&D causes 10 times higher stimulating effect on patent inventions than 1 dollar invested in the same purposes as the general corporate expenses. Generally, being now less than 3% of total corporate expenses on R&D, the venture capital generates no less than 15% of all production innovations in the US³².

Today clearly evident are key differences between American and European corporate model of organization of venture capital business. At the same time, while American transnational corpo-

³⁰ *Lebedeva Ye.A., Nedotko P.A.* Implementation of innovation in the US industry: role of minor research business / Ye.A. Lebedeva, P.A. Nedotko. – M.: «Nauka». – 1984. – P. 42. [In Russian].

³¹ See more information at: 2014 Global R&D Funding Forecast 2014. – Battelle – R&D Magazine. – [Electronic resource]. – Available from: <http://www.rdmag.com/articles/2013/12/2014-r-d-magazine-global-funding-forecast>

³² *Yenin A.V.* Competitiveness of Belorussian economy and innovation policy / A.V. Yenin, S.B. Miat, V.M. Rudenkov // Humanitarian Economic Journal. – 2006. – No. 2. – P. 93. [In Russian].

rations are characterized by attraction of venture capital to new high technologies, European transnational entities direct venture capital investments mainly to the development of existing companies where the government has the priority role in stimulating activities of venture capital funds.

In particular, the Netherlands is a shining example of the European model of venture financing, where the government guarantees covering 50% of losses on venture capital activity. Meanwhile, in the UK venture funds have the right to draw up to 30% of investment capital of pension funds, and in France there is a special government institution and private state bank that provides financial support to small innovative enterprises. In countries such as Germany and Italy measures have been developed to stimulate activity of risky enterprises through direct allocation of public funds, state guarantees, as well as reduced tax revenues and creating stock exchange markets. In Finland, back in 1994 public venture equity fund was established for direct investment in small innovative firms, while Belgian investment company GIMV, created in 1980 based on government-funded venture capital fund, today has become one of the most attractive investment targets for private capital.

In recent years, more and deeper convergence of national innovation policies of the EU countries allows the formation of corporate consortiums of risky capital of the European level. So, focused state support of venture capital industry in Western European countries results primarily in the rapid increase of volumes of venture capital, annual growth rates of which are currently 15 to 20%.

Key Areas of Upgrade of TNCs Technological Policy in the Context of Assuring Their Global Intellectual Leadership

Deepening technoglobalism processes and increased competition in the global IP market in recent decades objectively require the from transnational corporations substantial upgrade of their technological policy. This upgrade applies particularly to increasingly greater internationalization of corporate R&D delegating to its foreign units virtually all stages of the development of new technologies – from innovation to implementation in mass production and marketing of high-tech products on world markets. This is confirmed by, in particular, the share of innovation expenditures of overseas branches of the US transnational corpo-

rations in their research budgets: while in 1999 it amounted to 12.6% (USD 18.1 billion), in 2010 it was about 16% (USD 40.3 billion³³).

The data presented in Table 2 indicate that the United States today turned into a kind of platform for large-scale R&D units of foreign companies. In 2010 their total expenditures for these purposes amounted to nearly 41.3 billion US dollars with dominance of innovative investments in the manufacturing sector, the share of which is 72.4%.

Table 2 R&D expenses of us branches of foreign companies in 2010, USD million³⁴

| Country of origin of foreign countries | All sectors | Productive sector | | | | | | Non-productive sector | | |
|--|-------------|-------------------|-------------------|------------------|-----------------------------------|--------------------|--------------------------|-----------------------|-------------|--|
| | | Total, including | chemical industry | machine-building | computers and electronic products | electric equipment | transportation equipment | wholesale | information | professional, technical, and academic services |
| Canada | 575 | 314 | 1 | 9 | c.i. | 1 | 211 | 106 | 49 | 84 |
| France | 5248 | 4064 | 1360 | c.i. | 1891 | 225 | 71 | 145 | c.i. | 74 |
| Germany | 5679 | 4731 | 2099 | c.i. | 106 | 18 | 907 | 338 | c.i. | 79 |
| Japan | 5112 | 1842 | 713 | 117 | 479 | 47 | 287 | 2302 | 194 | 669 |
| Netherlands | 1910 | 1592 | 169 | c.i. | c.i. | 5 | c.i. | c.i. | 3 | 26 |
| Switzerland | 9086 | 7676 | 7103 | 40 | c.i. | c.i. | 6 | c.i. | 2 | 1019 |
| UK | 5975 | 5621 | 4046 | 45 | 282 | c.i. | 425 | 102 | 111 | 137 |
| Others | 7687 | 4054 | 1146 | 633 | 957 | 193 | | 2546 | 134 | 755 |
| All countries | 41272 | 29894 | 16638 | 2509 | 4731 | 621 | 2306 | 6035 | 1870 | 2843 |

c.i. – confidential information

³³ Science and Engineering Indicators 2014. – National Science Foundation, 2014. – P. 4-27.

³⁴ Calculated based at: Science and Engineering Indicators 2014. – National Science Foundation, 2014. – P. 4-27.

Now the most active in the R&D internationalization in the US are transnational corporations of Switzerland (22.0% of total innovation expenditures of foreign companies branches), the UK (14.5%), Germany (13.8%), as well as France, Japan, and the Netherlands (12.7%, 12.4%, and 4.6%, respectively). Overall, over 80% of R&D expenditures of foreign branches of transnational corporations in the US now falls for European, Japanese and Canadian companies, among which currently the basic flow of scientific and technical knowledge are circulating.

When characterizing industry-regional structure of innovative investments, for all countries (except Japan) prevalence chemical industry is observed as the object of innovative investment from branches of foreign transnational corporations in the United States, which accounts for over 40% of the total. For example, Swiss companies invest over 78.2% of total R&D investment in the US in the chemical industry, British companies – 72.0%, German ones – 37.0%, and the French – 33.5%.

However, in the context of other industries there is some variation in the structure of innovative investment of foreign corporations branches in the US: if Japanese companies prioritize investment in wholesale trade (45.0% of total funding in this country), the Canadian ones – the development of transport equipment (36.7%), and the French – in the manufacture of computer and electronic equipment (36.0%). Such distribution is explained by the presence of appropriate institutional preconditions in the US, primarily, cluster of innovation and effective demand for the products of these industries from foreign transnational corporations.

However, the current status of the US in global process of corporate internationalization of innovation is not limited to their performance of the role of "landfill" for scientific research of foreign corporation's branches. American transnational corporations, in turn, are also active participants of internationalization of research activity, spending almost 39.5 billion dollars on R&D of their foreign branches in 2010. According to Table. 3, Europe is now the largest "magnet" attracting foreign innovative investments of American corporations, which in 2010 accounted for almost 62% of the total of such investments. Next comes the Asia-

Pacific Region (21.1%), Canada (7.1%), Middle East (5.0%) and Latin America (4.9%).

Table 3 Geographic structure of R&D expenses of foreign branches of American transnational corporations in 2010, USD million³⁵

| Country/ Region | All sectors | Productive sector | | | | | | Non-productive sector | | |
|-----------------------------|-------------|-------------------|-------------------|------------------|-----------------------------------|--------------------|--------------------------|-----------------------|-------------|--|
| | | Total, including | chemical industry | machine-building | computers and electronic products | electric equipment | transportation equipment | wholesale | information | professional, technical, academic services |
| Canada | 2787 | 1449 | 434 | 26 | 286 | c.i. | 535 | 174 | 311 | 806 |
| Europe, including | 24406 | 18208 | 6351 | 963 | 2997 | 376 | 5047 | 1379 | 865 | 3855 |
| Belgium | 2116 | c.i. | c.i. | 15 | 9 | c.i. | c.i. | c.i. | c.i. | 321 |
| France | 1984 | 1783 | 410 | 96 | 575 | c.i. | 347 | 83 | 41 | 73 |
| Germany | 6713 | 5505 | 341 | 275 | 1017 | 190 | 3162 | 568 | 48 | 552 |
| Ireland | 1431 | 1045 | 585 | | 283 | 0 | 2 | 3 | 297 | |
| Netherlands | 1290 | 1074 | 701 | 28 | 41 | c.i. | c.i. | 10 | 52 | 151 |
| Switzerland | 1558 | 935 | 460 | 56 | 185 | 17 | c.i. | 259 | c.i. | c.i. |
| UK | 5905 | 3736 | 1695 | 191 | 323 | 28 | 984 | c.i. | 183 | 1778 |
| Latin America | 1949 | 1725 | 356 | c.i. | 96 | c.i. | 1030 | c.i. | c.i. | 142 |
| Africa | 88 | c.i. | 23 | 1 | c.i. | 0 | 9 | 4 | 0 | c.i. |
| Middle East including | 1965 | c.i. | 50 | c.i. | 640 | 0 | 0 | c.i. | c.i. | c.i. |
| Israel | 1948 | c.i. | 47 | c.i. | 640 | 0 | 0 | c.i. | c.i. | 950 |
| Asia and Pacific, including | 8313 | 5290 | 1319 | 275 | 2011 | 275 | 962 | 289 | 765 | 1955 |
| China | 1452 | c.i. | 101 | 41 | 348 | 109 | 55 | 9 | c.i. | 443 |
| India | 1644 | 446 | 83 | c.i. | 231 | 6 | 73 | c.i. | c.i. | 778 |
| Japan | 1885 | 1576 | 808 | 152 | 300 | c.i. | 74 | 57 | c.i. | c.i. |
| Singapore | 753 | 514 | 67 | c.i. | 424 | 8 | 12 | 12 | 18 | 206 |
| Republic of Korea | 835 | 780 | 49 | 19 | 166 | 0 | c.i. | c.i. | c.i. | 27 |
| All countries | 39470 | 27571 | 8532 | 1448 | 6030 | 703 | 7584 | 1975 | 2018 | 7759 |

c.i. – confidential information

³⁵ Science and Engineering Indicators 2014. – National Science Foundation, 2014. – P. 4-29.

However, the increased competition in the global IP market in recent years objectively requires significant upgrading of their technological policy from global transnational corporations. Such upgrade applies, above all, to reverse transfer of technology processes to countries where the parent companies are based with simultaneous legal registration of intellectual property which is qualitatively new form of internationalization of R&D activities of transnational corporations. Examples include, in particular, ET Water Systems, Nexus Q, Google, General Electric, which increasingly transfer developments of radical innovation within sectors and areas of the sixth technological structure in the US.

Among the reasons that led to this situation a major role was played by the active formation of industries sixth technological structure in the leading world which urges Western corporations to "lock" innovation in the parent company against the background of weak legal protection of intellectual property and the gradual increase of labor, energy and transportation costs in countries where branches of transnational corporations are based. In our view, a natural consequence of this process will be a new wave of "brain drain" to the developed countries.

Growing influence of transnationalizing entities in the global IP market structures is evident from the isolation of such institutions as creative corporations in the structure of global corporate sector. Among their number the following should be highlighted, in particular, Microsoft, Dell, Yahoo et al., the operations of which are not always motivated solely by economic expediency but concentrated around creative people. Moreover, the entire staff of such corporations is engaged primarily in intellectual development, and therefore – is most interested in realizing their creative potential even contrary to their economic interests. This is the reason for the fact that creative corporations often retain the narrow specialization that was intended when they were created and do not get conglomerate institutional forms.

Assessing the impact of transnational corporations on the global market of intellectual property, its ambiguity and inconsistency should be also noted. This is particularly reflected in the event of threats to innovation security of recipient countries for capital of Western transnational corporations which typically are included in implementation of technologically innovative projects in such countries due to active use of technological outsourcing mechanisms in their corporate business strategies.

However, this outsourcing has one significant drawback which lies in the possibility of "conservation" of technological backwardness of the countries where the companies are involved in performance of outsourcing "contracts". Examples of such countries, in particular, include India, to the companies of which now innovative international business actively outsources functions on software development for US companies. But in general it does not make a significant impact on the development of Indian science, since in this country only those technologies are finalized and improved that have long been the property of leading countries.

Another threat to national innovation security of developing countries from transnational capital is that Western transnational corporations seek to provide them with mainly capital-intensive technology. This ensures creation of jobs for developed countries and produces a powerful impact on the global labor market, which results in exacerbation of the employment problems due to reduced needs of transnational capital in the wage labor; increasing social stratification at the intrastate and regional levels through the growth gap in salaries of employees working in the structures of Western transnational corporations and employees of the companies; as well as braking processes of generation and commercialization of innovations created by domestic capital and experts.

We should not ignore the tendency of multinational corporations to unfair behavior in developing countries, including the acquisition of domestic enterprises solely for the know-how resulting in the loss of national priorities for economic development in the most technology-intensive industries and sectors of the domestic industry in the domestic and international markets.

Describing the activities of transnational corporations in the global IP market, it is impossible to neglect such negative factors as the transnational corporations' significant limitation of rights of other competitors to enter the commodity markets, resulting in their massive expansion of high technology products to selected sectors of regional markets and increased pressure on other producers of high-tech products. In this respect the experience of Russian Federation is indicative -due to actions of foreign transnational corporations in recent years the country's aircraft industry was significantly affected. Thus, the result of patenting 8 technologies in Russia in domain of helicopter building by Eurocopter France, of technology of processing of signals of secondary aircraft radar system corporation by Thompson, and 8 technolo-

gies in the area of engine construction by Yalestown Corporation was a complete patent monopolization of the propeller production process in Russian helicopter Ka-50 "Black Shark" and the method of operation thereof³⁶. In other words, production and sales of this specific model of helicopter require a relevant license from foreign companies.

Transnational corporations' prejudice to rights of other competitors on launch to commodity markets also relates provisions of license agreements prescribing possible exchange of rights to patents, therefore significantly slowing down their motivation for innovation activities. Although the companies themselves have a totally understandable goal of increase of their patent portfolios, the danger of agreements for shared licensing, however, is in their focus on distribution of global IP market between competitors. This intensifies monopoly of the global IP market in the interests of limited number of transnational corporations even more and enhances disproportions of scientific and technological development of countries and regions.

And, finally, key issues of reforming national patent law in terms of affluent business entities' active lobbying of laws favorable for them are closely connected to operation of transnational corporations. At the first place, this relates to implementation of IP legal protection mode favorable for corporate sector sometimes even contradictory to public interests. In particular, great impact of pharmaceutical companies and business IT entities on reformation of patent laws may serve as the example. It is commonly known that already starting from 1970-s large pharmaceutical corporations have been insisting on the need of higher level of patent protection of their development due to tremendous R&D expenses. At the same time, IT companies stand for lower level of protection or even complete abolishing of such protection due to the fact that their innovative activities are characterized by high level of cumulativeness, where patents greatly slow down development of new technology. In other words, depending of area of operation of transnational corporations their positions on patent protection may differ greatly which can cause some imbalance in convergence of national patent laws at the global level.

Conclusion

As of today, transnational corporations are key subjects at the global IP market. They are characterized not only by enormous

³⁶ *Savenko V.* Threats to economic security of Ukraine in the field of intellectual property rights / V. Savenko // Strategic Panorama. - 2009. - №4. - P. 113. [In Ukrainian].

scale of innovation activities and concentration of the lion's share of world generation and commercialization of IP, but also active tracking of occurrence of new technology already at the initial stage of fundamental research. Implementing the corporate technology policy and patenting technology created in course of them each transnational corporation forms its own patent portfolio and blocks academic research and development of its competitors.

Besides, outcome of corporate innovation developments and experimental research at the international level results in formation of relevant standards and rules of licensing within which all the products are manufactured that goes to relevant segment of the world market. This grants new status to modern transnational corporations in processes of international technology transfer at world's coordinates and results in emergence of threats to innovational safety of recipient countries of their capital through the transnational corporations' active application of mechanisms of technological outsourcing, their focus on purchase of foreign enterprises exclusively for know-how, significant restriction of rights of other competitors on launch at the commodity markets, powerful expansion of science-intense products to designated sectors of regional markets and increase of pressure on other producers of labor-intense products.

Among mechanisms of formation of patent portfolios of transnational corporations and their maintenance of high competitive advantages at the global market of intellectual property the highest efficiency is now demonstrated by merger and acquisition, cross-border strategic alliances in technology domain, R&D internationalization, cross licensing, and corporate patent wars. Furthermore, due to weak legal protection of intellectual property for past years countries where branches of transnational corporations are based demonstrate the process of some upgrade of corporate technology policy in transfer of technological processes to countries where parental companies are based, and "fixation" of innovation development in measures thereof with simultaneous legal registration of intellectual property rights.

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