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INNOVATIONS OF TRANSNATIONAL CORPORATIONS IN TODAY'S CONDITIONS

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The article considers the issue of innovation activities carried out by transnational corporations, as well as the impact of the COVID-19 pandemic on the innovative sphere as such. The motivation behind international companies' reorientation on the emerging economies in part of innovations in R&D and the need for unique competitive advantages over other companies is also discussed. Digitization, robotization, and automation are becoming more and more in demand and will be thus financed by transnational corporations with the increasing intensity.

Keywords: transnational corporation (TNC); innovation sector; research and development (R&D); COVID-19 pandemic

Introduction

Innovation is one of the most important competitive advantages of any company in the 21st century (Chatzoglou & Chftzoudes, 2018). Not only different countries, but also

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international companies are interested in stimulating innovations and getting benefits from innovative results (for example, profit, new workplaces, better public image and so on). International corporations, implementing the strategy of leading innovation at the global markets, are forced to be more and more creative, considering the environment of global innovative hypercompetition. This leads to sharpening the overall process of innovative competition between the world's leading transnational corporations.

In the year 2018 the international corporations included in the top-100 largest non-financial TNCs invested over 350 bln USD in R&D. This represents more than a tercile of the total investments in the latest advanced developments. At the same time, the share of R&D (relative to sales) among the top-100 companies in developing countries is significantly lower.

The volume of international investments in innovative projects is overall significant. During the five years before the current COVID-19 pandemic, TNCs have announced 5300 R&D projects outside their national markets, this is more than 6% of all announced new investment projects. Noteworthy here, in the five years before that this figure was lower and equalled to 4000 (World Investment Report, 2019).

The dynamics of the innovation sector development is significantly exceeding the growth rate of the world GDP, amounting to 5,2% in 2018 (Global Innovation Index, 2020).

Main part of the research

Research and Development in a Pandemic Environment

The COVID-19 pandemic which has caused a massive recession in the world economy, is actually having rather mixed effects on the state of the innovation sector. On the one hand, drastic slowdown in economic growth in the vast majority of countries across the world, and the losses that corporations are experiencing due to the pandemic constraints have led to an objective reduction in financial resources that could potentially be invested in innovations. On the other hand, innovations in the pharmaceutical sector and biotechnologies are being heavily funded in order to fight COVID-19. A great potential of innovative development has been identified in the healthcare sector which is gearing to combat the negative health effects from COVID-19. In the face of forced transition to a remote work mode for the absolute majority of employees worldwide, there has been a forced development of digitalization which is also supporting various innovations.

During the 20th century, transnational corporations traditionally carried out their major innovative activities, industrial R&D especially, only in their home countries, viewing this as an element of their own strategic dominance in an industry (Jha & Dhanaraj, 2018). But over the past two decades TNCs have established R&D activities in developing countries as well and have begun to consider this activity as not only a mechanism for adapting products and processes to specific local conditions (Egan, 2017). In recent years, major R&D activities of corporations have sometimes been transferred to the emerging markets where subsidiaries of these TNCs are presented, primarily this concerns such huge markets as China and India (Yip & McKern, 2017).

Analyzing the statistical reporting on R&D results, it should be noted that this aspect of TNCs' activities is lagging behind only in Africa and Latin America. The key region for R&D of many TNCs is often Asia. If we compare developing countries only, it gets obvious

that China, India, Czech Republic, South Korea and Israel account for the bulk of all R&D activities.

Tab. 1 shows the evolution of R&D expenditures in individual countries as a percentage of GDP, while Tab. 2 shows the share of R&D activities of the US multinational corporations in their overseas affiliates.

It should be emphasized here that R&T activities shown in Tab. 1 refer to all R&D activities in each country, including not only companies, but also the public sector, universities, research centers and the like. In this ranking, the leaders are the USA, Japan, Nordic countries, Germany, Switzerland, Israel, South Korea and China.

Table 1 - R&D expenditures in the selected countries as a percentage of GDP, 1996-2015
(Source: Grosse, 2019)

Country	1996	2000	2005	2010	2014	2015
Canada	1,62	1,87	1,99	1,84	1,61	-
P.R.China	0,57	0,9	1,32	1,73	2,05	2,07
France	2,21	2,08	,204	2,18	2,26	2,23
Germany	2,14	2,39	2,42	2,71	2,87	2,88
India	0,63	0,74	0,81	0,8	0,82	0,63
Indonesia	-	0,07	-	0,08	0,08	-
Israel	5,6	3,93	4,04	3,93	4,11	4,27
Japan	2,77	3,0	3,31	3,25	3,58	3,28
Russian Federation	0,97	1,05	1,07	1,13	1,19	1,13
Singapore	1,32	1,82	2,16	2,01	2,19	-
South Korea	2,24	2,18	2,63	3,47	4,29	4,23
Great Britain	1,71	1,72	1,63	1,69	1,7	1,73
The USA	2,44	2,62	2,51	2,74	2,73	2,79
Sweden	3,32	3,91	3,39	3,22	3,16	3,26
Switzerland	2,45	2,33	2,68	2,73	2,97	-
Brazil	-	1,0	1,0	1,16	1,24	-
Netherlands	1,86	1,81	1,79	1,72	1,97	2,01
OECD overall	2,14	2,3	2,22	2,38	2,42	2,55
Total in the world	1,99	2,08	1,99	2,05	2,12	2,23

Although the data in Tab. 2 pertain to one country only — the US, they are representative enough to characterize the general trends in foreign investments in R&D as a whole, across different countries. These data also indicate that Japan, Nordic countries, Germany, Switzerland, Israel and China, along with Great Britain and India, are among the top preferred R&D sites of the US corporations.

With the intensifying international competition at the world markets, corporations now need unique competition advantages over other companies. Some competitive advantages may include the access to scarce natural resources, such as oil, gold or a favorable climate for primary industries, such as agriculture. The only competitive advantage that does not require any particular geographical binding and thus can be realized by companies anywhere is innovation.

Table 2 - R&D expenses incurred by foreign divisions of the US TNCs, by region/country, 1982-2015 (in mln USD)
(Source: U.S. Department of Commerce, 2016)

	1982	1995	2000	2005	2010	2015	2016
Total	3851	12582	19758	27653	36991	48750	54797
Industrial RDT	3247	10791	17822	23508	29385	-	-
Canada	505	1068	1874	2433	3040	3178	3430
Europe	2982	9144	12938	18805	24155	29825	31274
France	332	1271	1445	2248	2171	2359	2213
Germany	1079	3068	3105	4609	7039	8272	8033
Italy	150	346	575	580	582	806	835
Netherlands	65	495	369	392	1484	1478	1173
Sweden	28	691	1335	1652	1576	670	708
Switzerland	60	242	220	878	1123	3735	3865
Great Britain	824	1935	-	5406	5157	5346	6165
Asia, Pacific	238	1865	3727	4764	7210	10712	14425
China	-	-	-	-	1579	2179	3428
India	-	-	-	-	1377	2557	3216
Japan	112	1286	1433	1717	1872	2070	2438
Singapore	-	63	548	576	624	642	1755
Latin America and the Caribbean	169	389	665	841	1465	2750	2374
Brazil	97	249	250	405	791	1224	883
Middle East	11	97	527	770	1063	2187	3150
Israel	11	97	527	767	1060	2153	2955
Africa	25	19	27	40	57	128	145
RSA	23	17	22	31	43	94	38

As a result, international corporations, taking advantage of new opportunities, began to invest in R&D outside their home countries, keeping the following objectives in mind:

- lower costs of human resources, primarily intellectual capital;
- the initial adaptation of R&D to the markets of developing countries where the research is being conducted.

30-40 years ago, all innovative activities were concentrated in the home countries of transnationalized structures, and only occasional projects were local developments of products, with their adaptation to local demand conditions. There have been cases where some TNCs have acquired companies abroad that have conducted their own R&D, so that these acquired affiliates have a sufficiently independent activity in the field of innovation. At the same time, in several cases TNC operated R&D units outside their home countries.

Classification of transnational corporations

Given the diversity of strategies applied by TNC in relation to R&D, all corporations can be classified into four types:

- Adapting products originally produced in other countries to local market conditions. In this case, all R&D is concentrated in a country of corporate headquarters;
- R&D carried out in developing countries which can be applied both in the home country and in other countries because local conditions in a host country may be more hospitable as compared to other options;
- R&D in a place where innovative activities are carried out by other firms in the same industry to maximize the benefits from the already developed innovation environment;

Participation in the global R&D network with the aim of minimizing costs, taking into account market specificities and availability of knowledge, skills and other resources of the researchers involved in the implementation of innovation projects.

The concept of "reverse innovation" (Govindarajan & Ravi, 2011) has been introduced in relation to TNCs' R&D activities This is when research is carried out within a relatively low-cost developing market and is later exported to the home countries of a TNC and other countries to be then successfully commercialized.

Today, this phenomenon is largely confined to very large markets, such as China and India, with their use of qualified technical and managerial personnel. Examples of such reverse innovations include the Lullaby device for premature children (created by GE in India) or electric cars (those of General Motors and Volkswagen but developed in China). This innovative practice is likely to become much more common in the near future as emerging markets become increasingly important.

Types of R&D

Since global transport and communications costs have been reducing, TNCs have shifted to the geographical redistribution of their R&D centers, taking into account various types of research-related activities. Three types of R&D are identified in the classification of the U.S. National Research Fund (NRFR) — basic, applied, and scientific research (the process of converting information from basic and applied research into a form suitable for its economic development). Fundamental research can be equally carried out by corporations in both developing and developed countries. Basic research is usually concentrated around universities and public-funded programs. If the state wants to encourage corporations to undertake basic research in a particular area, a specific direction in R&D is often heavily subsidized by the state. In any case, basic research normally goes well beyond industrial, corporate R&D.

Applied research, on the other hand, is precisely the kind of activity that is preferred by TNCs. Such applied innovative studies include the following directions:

- creation of new products (for local and/or international use);
- creation of new processes for production and distribution of goods and services;
- adapting products to local conditions;
- adapting processes to local conditions.

Applied research in emerging markets is a relatively small but growing part of R&D carried out by TNCs' foreign branches as their products, services, and business processes adapt to the local environment. Most R&D in emerging markets have been implemented by some automobile firms, such as Volkswagen in China and General Motors in Brazil and

China, as well as in some areas of information technology and telecommunications by such firms as Motorola in Brazil, Samsung in China and IBM and Microsoft in India.

Such research development includes a number of areas related to the production of new materials, devices, systems or methods, including design, development and improvement of prototypes as well as transformation of various production processes according to specific requirements. TNCs are actively engaged in such fields of activity within the developing markets (Jha et al., 2018). This R&D area may in fact be the most important one for emerging markets, as their efforts often involve adapting the already existing products or processes to local market requirements.

Motivations behind R&D investment

Based on the results of studying foreign R&D over the past three decades, funded by international corporations within their branches located in emerging markets, four types of motivations leading to the investment in these types of activities can be determined and singled out:

- international corporations invest more actively in the research activities of their affiliates in the countries where local markets are themselves quite intensive;
- as the practice of real protection of intellectual property objects has gradually spread on developing countries, an increasing number of international corporations have decided to intensify their R&D activities in their branches located in much lower-cost jurisdictions;
- R&D activities on the side of corporate affiliates will be increased in those countries and regions where the rates of local R&D and innovative activity are higher;
- R&D is usually carried out within the branches located in those developing countries where TNC has a greater local presence overall.

Initially, corporate-funded R&D in foreign branches located in developing countries was aimed at adapting corporate products and services to specific local conditions. Today however, branches within emerging markets are already implementing independent scientific programs, the results of which are subsequently distributed globally with the help of corporate headquarters and their global connections.

Summary of the article

Nowadays the most promising technological directions for the development of the innovative sphere are: automation using robotics; supply chains digitization; and layer-printing technology (Global Innovation Index, 2020). Given the optimistic forecasts, COVID-19 will soon turn into just a seasonal disease, while automation, robotization and digitalization will become strong sought-after trends, heavily financed by transnational corporate businesses.

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