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ANALYSING THE BELARUS POSITION IN THE INTERNATIONAL INNOVATION RANKINGS OF COUNTRIES AND STATE INNOVATION POLICY

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Introduction. The formation of a modern economic model in developed and rapidly developing countries is largely due to the increasing role of innovation and digital transformation. The place and role of Belarus in the global economy will largely be determined by its innovative development, the ability to build and effectively use own high-tech technologies, the degree of the country's presence in the international market of high and new technologies. Innovation is considered the main driver of economic growth, and innovation policy is an integral part of any country's economic policy. In modern realities, this is an objective condition for ensuring national security and sustainable development of the state.

The position of Belarus in innovation rankings

For the state, when determining the degree of its innovative development, its place in innovation rankings of other countries is very important. Such a comparative analysis with the leading developed and developing countries in the global economy as a whole enables to identify strong and weak sides of the country's innovative development and reveal factors constraining this development.

The most full picture of innovative development in Belarus is presented by its position in the Global Innovation Index (GII), particularly as Belarus' rank has radically changed several times over the past five years. Unfortunately, Belarus is not represented among 141 economies in another important ranking, World Economic Forum Global Competitiveness Index (WEF GCI), and many values of the Global Innovation Index are based on GCI data which affects the country's GII ranking. But there is hope that our country will be included into report in the near future.

The Innovation Index is compiled pursuant to the INSEAD methods and ranks world economies according to their innovative capabilities. In 2020, the report covers 131 economies and is based on 80 indicators, grouped by "inputs" and "outputs" of innovation, and is aimed at covering multidimensional aspects of innovative development.

The final index is calculated as a weighted sum of two groups of indicators or sub-rankings. First: available resources and conditions for innovation - Innovation Input, which includes institutions (legislative framework, political situation, business environment); human capital and research (education, higher education, research and development); infrastructure (ICT, basic infrastructure, environmental sustainability); development of the internal market (loans, investments, trade, competition); business development (employee knowledge, innovative communications, knowledge acquisition). The second sub-ranking reflects the achieved practical outcomes of innovation – Innovation Output, it includes indicators of technology development and the knowledge economy (knowledge creation, their impact and dissemination) and the results of intellectual activity (intangible assets, creative goods and services, online creativity). Thus, the final index is a cost-benefit ratio that enables to objectively assess the effect of innovation efforts in each country and compare them with other states.

The main theme of GII 13th report published in 2020 was "Who will finance innovation?" By the way, in 2019 the theme was "Creating Healthy Lives – The Future of Medical Innovation". The title question can be attributed to the ongoing COVID situation in the world which, on the one hand, poses risks for long-term economic growth (decline in production, falling incomes and contraction of demand, disruption of logistics links and chains, deterioration of human capital). But, on the other hand, it gives an opportunity to form a sharp growth due to adaptation to new business models, business processes and changes in consumer behavior (digitalization of the economy, retraining of the population, developing online/remote services).

All this has a strong impact, according to GII 2020, on the long-term and sustainable growth of global innovation, since there are real threats to the openness of the world and international cooperation in the field of innovation. This influence on scientific and innovation systems will manifest itself after some time, but already today it can be seen that some innovative activities are being restrained, especially in traditional areas of the economy. At the same time, we may notice accelerating inventions in other fields such as healthcare, education, tourism and e-commerce. But most importantly, a concern remains that some major research projects may be frozen. In particular, the report notes that "the money to fund innovative ventures is drying up. Venture capital (VC) deals are in sharp decline across North America, Asia, and Europe. The impact of this shortage in innovation finance will be uneven, with the negative effects felt more heavily by early-stage VCs, by R&D-intensive start-ups, and in countries that are not typically VC hotspots". [1]

The issue of costs-results ratio of innovation is becoming more and more urgent. And the main task of innovation policy of all countries remains the transition from the number of innovations to their quality.

With all the global changes, even in the year of the pandemic, the index shows that the main trends in this ranking have remained. For example, Switzerland has been on top for several years now. Together with it, the top ten in 2020 is represented by Sweden, the United States, the United Kingdom, the Netherlands, Denmark, Finland, Singapore, Germany and the Republic of Korea. These countries are characterized by the highest indicators of both resources and results of innovation, but the distinctive property of leaders is the maximum level of innovation efficiency – the resources-results ratio.

From these standpoint, the countries included in the GII-2020 are viewed from the angle of how their results match expectations from investments at a particular income level. All countries are divided into four groups by income level, each of these groups having highly effective innovators. Among the high-income countries, Switzerland, the Netherlands and Sweden get the greatest feedback from investment in innovation. The only exception is China ranking 14th for the second year in a row and remaining the only middle-income country in the top thirty. China has equaled the output of innovative products with Germany, Great Britain, Finland, Israel and the United States with significantly smaller investments. It is among the leaders in the main indicators of innovative development: the number of trademark applications; the number of patent applications for industrial designs; the export of creative goods; the number of applications for utility models; R&D costs; expenses of global companies intensively engaged in R&D; the quality of universities.

Vietnam and India demonstrate high efficiency of innovation activity in the lower segment of middle-income countries. Of particular interest is India (48th rank), whose economy is the third in the world in terms of innovation with a lower-than-average income. Over the past five years, the country has demonstrated a steady improvement in its ranking, first of all, being distinguished by scientific results in the global information and communication technology (ICT) services industry, as evidenced by the first place in the export of ICT services [1].

The Russian Federation, Belarus' partner in the EEU and the Customs Union, belongs to countries with an above-average income level, ranking 47th in the GII 2020. It should be noted that the position of this country in the innovation resources subindex has traditionally been much higher than in the innovation results subindex (42nd rank against 58th). Russia holds high positions in four of the seven groups of GII indices: in three indices related to "resources and conditions for innovation": human capital and research, the level of market development, the level of business development and one sub-index reflecting scientific results. For instance, the country ranked 17th in the number of national patents issued, and 9th in utility models [2].

Belarus is in the group of countries with a higher-than-average GDP per capita. In this group, it ranked 18th out of 34, but among European countries - only 37th out of 39. At the same time, the indicators of innovative development of Belarus are lower than anticipated results for this category of countries. This indicates a significant underutilized innovation potential.

In 2020, Belarus ranked 64th (index 31.27), having improved by 8 positions compared to 2019 (rank 72) or by 22 positions compared to 2018 (rank 86). Yet, it has not reached its best indicators for the entire period of being in GII since 2012, which were in 2015, when Belarus ranked 53rd with the value of 38.2, the lowest was recorded in 2017 - 88th rank with the value of 30.0. It can be said that the improvement of Belarus' position in the GII is a trend of recent years. However, compared to neighboring countries, Belarus is an outsider in this ranking: Latvia ranks 36th, Poland - 38th, Lithuania - 40th, Ukraine - 45th, and Russia - 47th.

But there are also positive trends. For example, 2020 removed the gap between sub-ratings characteristic of last year. In terms of resources, Belarus shifted to the 67th position from the 50th, or down 17 points against last year, and is on the 61st position in terms of results achieved. As a result, Belarus took the overall 64th place.

In the sub-rating "resources and conditions for innovation" Belarus has the highest indicator in the category "Human capital and research" — 37th rank. Here, the ranking compilers highlighted among the strong sides the ratio of students to teachers, the number of students, the export of ICT services, the percentage of companies offering training to employees, and a number of other areas mainly related to the field of education. But in terms of the share of employed women with higher education, Belarus has lost its leadership, being the second.

In the new ranking, Belarus has lost its position in assessing the development of institutions, the political and regulatory environment, and the development of the domestic market. Belarus took the 119th position in terms of lending (-4), investments - 97th (-80), competition in the market and its size - 59th (-5). International experts gave a low assessment of such indicators as the corruption perception index, the rule of law, government efficiency, and the quality of the regulatory framework. Thus, the problems of institutional development are a brake on the development of competitiveness and economic growth [3].

The results of innovation activity in the ranking consist of the development of technology and the knowledge economy, as well as the creative activity outcomes. According to the second sub-index, the analysis of indicators showed a significant gap between Belarus and other countries in terms of the actual results of innovation activity. Based on "Technology development and knowledge economy" indicator - rank 46, having improved its position by five points. In terms of the influence of knowledge, we are up to the 29th place (+19), and in terms of knowledge penetration we are in the 41st place (+14), but we have lost six positions in knowledge creation, showing the 58th rank.

According to creative activity outcomes, Belarus is up 29 points ranking 97th. This indicator evaluates intangible assets (130th), creative products and services (104th), as well as creative activity on the Internet (26th). The latter has been improved by the Wikipedia volunteer editors (38th rank in the world), as well as mobile application developers (1st). Progress in creative products and services compensates for the low performance of the national movie industry, newspapers and other media [4].

Pay attention that innovative forces are consolidating around scientific and technical clusters and, to assess their impact on the development of innovations, the GII authors have been forming a special "cluster rating" for the third year in a row. Since 2018, the rating has consistently been headed by the Tokyo - Yokohama cluster (Japan), which has concentrated the largest group of inventors and authors of scientific publications.

However, for the first time GII-2020 has provided with the ranking of the first hundred clusters according to their research and technical capacity, which is calculated as a quotient of the amount of patents and scientific publications with reference to population. This new perspective shows that many European and American clusters are more capacious in terms of research technologies than their Asian counterparts. The most science- and technology-intensive clusters are Cambridge and Oxford in the United Kingdom. They are followed by Eindhoven (Netherlands) and San Jose-San Francisco (USA).

Elements of the cluster approach can be found in many instruments of modern innovation policy in developed countries. The development of innovation clusters and cluster initiatives has a number of advantages and, other things being equal, ensures the activation of innovation activity [5, p. 142]. The cluster policy in Belarus (implemented since 2008) has already yielded positive results. The assessment of clusters is important as an indicator of cooperation between universities and business, which in a certain way affects the GII-2020 indicator of business and innovation, according to which the Republic is at very low position ranking 127th.

The development of an innovative economy, based on creativity and innovation, increases the importance of intellectual property as a measure of the economic value of this intellectual creativity. Based on this, one of the most important global indicators of innovation is the indicator of the number of patent applications. In December 2020, the World Intellectual Property Organization (WIPO) published a new patent ranking of the countries - World Intellectual Property Indicators 2020. It ranges the patent activity of 171 countries of the world and characterizes the degree of innovative potential of technological development of countries and regions. Reports with data on the patent activity of states, are, as a rule, one year late, as they require international comparison after data have been published by national patent services.

Belarus ranks 62nd, having submitted a total of 393 applications for the issuance of inventions patents. At the same time, 298 applications were submitted by national applicants, which is 65.6% of the number of applications received from national applicants in 2018. 334 applications have been received for the issuance of utility model patents, of which 276 are applications from national applicants. There is a positive trend in increased share of applications filed for inventions. The lag in this indicator is very clearly demonstrated by comparison with the leaders. China is in the first

place with 1,400,661 applications, the second place is occupied by the USA with a large margin – 621,453, the third – Japan with 307,969 applications. Our closest neighbors: Russia ranks 8th – 35,511 applications, Poland – 27th (3,999), Ukraine – 28th (3,852). We are close to such countries as Ecuador (ranking 60th – 437 applications) and Bangladesh (61st – 413 applications) [6].

Reasonable use of the results of intellectual activity is one of the main internal resources of any state, the creation of innovative developments, allows updating the technological structure of the national economy. It should be noted that Belarus has potential opportunities for the national innovation market, however, as statistics show, this powerful factor is not fully realized in our country. And here we are not talking about creating intellectual labor products, but rather about increasing the efficiency of their commercialization. Since the commercialization of innovations is at a low level, which is associated with the protection of intellectual property, guarantees of property rights, patent activity.

At the same time, Belarus shows good results in terms of the digitalization of the economy. For example, according to the E-government Development Index (EGDI), which is calculated on the basis of three indicators: the development of electronic services, the development of human capital and the development of telecommunications infrastructure, in 2020, Belarus was within the group of countries with a "very high" EGDI index along with Russia, Greece, Monaco, Poland, Portugal, ranking 40th with an index of 0.8094. As for sub-indices, Belarus has a very high level of human capital development (2.6% increment with the value of 0.8912 against 2018), and in terms of information and communication infrastructure development (up 20.3% with the value of 0.8212). Based on the data obtained, it can be concluded that a system of high-quality provision of public electronic services to citizens and businesses has been created within the framework of a single organizational and communication space [7].

The goal of IT transformation of industries is to optimize costs, efficient use and maintenance of infrastructure elements, which will enable the Republic of Belarus to formulate a new standard of their work and, consequently, increase the efficiency of all economy sectors [7].

Directions of the state innovation policy. The above ranking analysis is a guideline for the state, business and society, it allows to identify the strengths and weaknesses of ongoing processes, to form their own policies and strategies in the field of innovation. The practice of innovative development of countries has proved that the innovative success of the national economy cannot be achieved only with the help of market mechanisms, even the most perfect ones. We need an active innovative activity of the state, that should work purposefully and consistently at all stages of the innovation cycle. In modern conditions, the role of the state is becoming even more significant, which is due to the fact that the speed of modern changes is constant, and more and more factors of innovative development have to be taken into account.

It is possible to identify the main directions of the state's activities in the field of innovative development. The following areas remain traditional: the state as the creator of the legal framework and infrastructure; as a source of financing; as a customer of innovations, forming the demand for new technologies and products, through state orders for innovations. In modern conditions, the role of the state as the creator of new competencies and the formation of a culture of innovation has increased.

In the Republic of Belarus, in accordance with the Law on state innovation policy and innovation activity in the Republic of Belarus, the defining documents ensuring the implementation of the main directions of the state innovation policy are the State Programs of innovative development of the country (GPIR), elaborated for 5 year period. The last program (for 2021-2025) is closely connected with the national strategy for sustainable socio-economic development of the Republic of Belarus for the period up to 2030 and with State programs of socio-economic orientation, State programs of national security (the list of programs was approved by Government Resolution No. 759 of 12/24/2020); with State and regional scientific and technical programs (the list of programs was approved by Government Resolution No. 173 of 26.03.2021); with State research programs (the list of programs was approved by Government Resolution No. 438 of 27.07.2020). This ensures unity in achieving the goals of economic and social development of the Republic of Belarus.

The innovative development of the Republic of Belarus is continuing at the international level, primarily in cooperation with public administration bodies and development institutions of the CIS countries. For example, in 2020, the Interstate Program of Innovative Cooperation of the CIS member states for the period up to 2030 was developed and approved by the decision of the Council of Heads of Government .

One of the main issues of innovative development is still the issue of innovations financing. These include the issues of underdevelopment of financial mechanisms to support innovative entrepreneurship and independent innovative projects; budgetary expenditures and underfunding of research that ensures the country's economy competitiveness in the world market.

Despite the priority tasks of innovation policy, the statistics of innovations in Belarus in the last decade indicates the limited resources of innovative development. This can be judged by the indicator of the knowledge intensity of GDP, which is the most important in assessing the prospects for innovative development. Its importance can be judged by the fact that the reviews of scientific, technological and innovative development of the OECD begin with an assessment of this indicator. It is also the main one in implementing the UN Sustainable Development Goals (SDGs), to which Belarus has joined (implementation of Goal 9).

For Belarus, this is still the main challenge, since the GDP knowledge intensity is still at a level not exceeding 0.6 - 0.7%, which is significantly lower than the European average (2%) and the critical level of economic security (1%). With the financing of the program for 2021-2025, this value should reach 1%. This is the average for the EEU. In this union, only Russian GDP has the value of 1%. Kazakhstan - 0.14%, Armenia - 0.23%, Kyrgyzstan - 0.12% [8].

The state, choosing the path of innovative development in modern conditions, increasingly understands that it cannot cope with the limitations of its resources (primarily, material). In addition, there is a shortage of the company's

own funds, which is not replenished through the influx of private investment. Ensuring economic growth and competitiveness of the national economy is impossible without a fundamental change in the financing systems of innovative development.

The basis of financing should be a combination of budget and market approaches, with the central role of financial infrastructure and the systemic interaction of business, government and science in the form of public-private partnership. A significant role should be played by the commercialization of innovations, which ensures an increase in the financial return on innovation. The fundamental principles of the organization of financing should be the multiplicity of sources of financing.

The adopted state program of innovative development for 2021-2025 had changed approaches to financing innovative projects included in the program. It is planned to gradually abandon the gratuitous presentation of innovative funds and switch to a returnable basis for allocating funds by the Belarusian Innovation Fund on preferential terms at half the refinancing rate. There is also a differentiation of state support from innovative funds on an irrevocable basis, depending on the level of technologies being implemented. The principle of "more level of innovation — more amount of state support" will be implemented.

It is planned to differentiate the volume of state support from innovative funds on an irrevocable basis, depending on the level of technologies being implemented and social orientation. For instance, for projects based on technologies of the VI technological order and above, the volume of innovation funds attracted on an irrevocable basis in general cannot exceed 50%; for projects of the V technological order – not more than 40%; for projects of the IV technological order and below – not more than 20%.

Differentiation is also introduced to finance projects using innovations of domestic and foreign developments. The most promising mechanism of innovative development is venture financing.

In modern conditions, there is a certain interest in venture financing in Belarus, but there are no funds and organizations in the country active in venture investments, the Belarusian Innovation Fund is endowed with the functions of the state venture fund, which finances long-term high-risk investments in the capital of newly created high-tech promising companies focused on the development and production of high-tech products. In 2017, the Belarusian Innovation Fund, together with the Russian Venture Company, initiated the creation of the Investment Partnership "Russian-Belarusian Venture Investment Fund" (RBF Venture) focused on financing Belarusian and Russian innovative startups. The main activity of this Fund addresses financing projects of promising high-tech companies that can produce results for both countries. Projects are considered in the field of healthcare, medicine using IT technologies, online services, portable devices, in the field of transport, industrial technologies. The fund's industry focus is the IT sphere in a broad sense, including Adtech, AgTech, EdTech, and MedTech segments.

Conclusion. Belarus has a high position in the world in terms of parameters reflecting innovative potential, such as the level of secondary and higher education, the availability of research potential; the availability of highly qualified personnel capable of creating high-tech products and selling them on foreign markets; the development of information and communication infrastructure; certain criteria for the development of the business environment (ease of starting a business, openness of the economy). However, implementing this potential is far behind the most successful economies and countries of the Eastern European region, and requires an increase in the efficiency of the innovation process.

The Republic of Belarus has the necessary institutional framework and is interested in expanding permanent cooperation, both at the international and national levels, aimed at boosting innovation and digital transformation of the economy. Priorities have been defined in the country's program documents and are aimed at the optimal combination of its own scientific and technological potential with the promotion of domestic technologies to the world market and the transfer of new foreign technologies.

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