



The Role of Scientific Research in Economic Development

Khasankhonova Nodira Isametdinovna

Senior Lecturer, PhD Department “Economics, management, taxes and insurance”
Tashkent Financial Institute, Index 100000, Uzbekistan, Tashkent city
xasanxonova@mail.ru

ABSTRACT

In the article is considered the real state of products' science-intensiveness in the country. In particular, the category of science intensity of products, its main constituent factors such as research, development, inventions, R&D costs, innovative products are discussed. In the article analyzed the Decree of the President of the Republic of Uzbekistan dated April 1, 2021 No. DP-5047 "On measures to further improve state policy in the field of science and public administration in the field of innovative development", its effectiveness in science-intensive products.

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INTRODUCTION

At the new stage of reforms in Uzbekistan, measures have been taken in recent years to effectively conduct research in a number of priority areas for the development of the knowledge economy. In particular, scientific and research work is carried out in the fields of physics, chemistry, biology, engineering, computer programs. However, the gap between scientific research and innovation in the country hinders the development of the knowledge economy. In particular, "... the biggest shortcoming in socio-economic activity today is the lack of knowledge, which, unfortunately, is felt in all areas.

However, it is impossible to develop any region or industry without modern science and knowledge”¹. Also, “... the lack of interest of the industry in the technological development of domestic scientists and the implementation of research results hinders the technological development of the country's economy and is a heavy burden on the state budget”². This situation has made the adaptation of science and education to the changing conditions and their effective use in accelerating the innovative development of the country one of the most pressing issues of the day and showed the objective need to further strengthen research in this area.

International patent applications filed via WIPO’s Patent Cooperation Treaty (PCT), a widely used metric for measuring innovative activity, grew by 0.9% in 2021 to reach 277,500 applications – the highest-ever level. Asia manifested its lead as the largest origin of international patent applications, accounting for 54.1% of all applications in 2021, up from 38.5% in 2011.

WIPO's global trademark (Madrid System for the International Registration of Marks) and design (Hague System for the International Registration of Industrial Designs) filing systems, used to protect and promote brands and the look and feel of products like mobile phones, each notched double-digit growth to mark new records as did WIPO's anti-cyber squatting and arbitration and mediation activities³.

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Although little has been theoretically studied about the role of research in the development of the economy, it has been partially studied in the scientific work of Paul Vigna, Michael Casey, Melanie Swan, William Mougayar, Roger Wattenhofer, Pavan Duggal, Siraj Raval, Edward Castronova. In particular, Paul Vigna analyzed the impact of blockchain technology on the global economy, the role of large corporations in this process, and Michael Casey analyzed the positive and negative impacts of blockchain technology on the global economy, with a special focus on blockchain technology⁴.

Today the digitalization of the economy. new directions of educational development N.Inagomova, F.Botirova⁵, N.Khasankhonova⁶, V.Klochkov⁷, A.E.Varshavskiy⁸, O.G.Uzun⁹, Yu.P.Anisimov, O.E.Jarikova¹⁰. In their works, they considered the essence of the concept of "knowledge intensity of products", proposed various methods for its assessment.

¹Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis. // People's word. December 30, 2020.

²Decree of the President of the Republic of Uzbekistan dated October 29, 2020 No PF-6097 "On approval of the Concept for the development of science until 2030". <https://www.lex.uz/docs/5073447>.

³https://www.wipo.int/pressroom/en/articles/2022/article_0002.html

⁴Paul Vigna, Michael Casey. The Age of Cryptocurrency: How Bitcoin and the Blockchain Are Challenging the Global Economic Order., 2015.

⁵I.Nargiza, B.F.Madyorovna. Digitalization of the economy. new directions of educational development. - Conferencea, 2021

⁶N.I.Khasankhonova. Attention to the scientific quality of products. Т. : “Economics and Finance”, 2021. №9. -P. 48-54

⁷Клочков В.В. Управление инновационным развитием наукоемкой промышленности: модели и решения: монография / В.В. Клочков. – М.: Научное издание Российской академии наук Институт проблем управления им. В.А. Трапезникова РАН), 2010.

⁸ Варшавский А.Е. Наукоемкие отрасли и высокие технологии: определение, показатели, техническая политика, удельный вес в структуре экономики России // Экономические науки современной России №2, 2008.

⁹ Узун О.Г. Исследование границ области применения показателя наукоемкости // Экономика и управление предприятиями машиностроительной отрасли: проблема теории и практики №4 (12), 2010.

¹⁰ Анисимов Ю.П., Жарикова О.Е. Анализ методов оценки наукоемкости продукции. Журнал «Организатор производства. Область Экономика и бизнес». 2012.

At the same time, the categories of knowledge-intensive products, its main constituent factors such as research, development, inventions, rationality of R&D costs, innovative products need further scientific consideration and clarification.

ANALYSIS AND RESULTS

Artificial intelligence, nanotechnology, microchips, know-how now play an important role in the field of innovation. As Uzbekistan has chosen to develop science, it must choose the direction it needs. The country will contribute to the full formation of the knowledge economy in this direction.

Attention to youth is one of the priorities of state policy in Uzbekistan, including the President of the Republic of Uzbekistan Sh.M.Mirziyoevsaid: «As almost half of the population of Uzbekistan is young, the state strategy is to create the necessary conditions for them to show their potential, to involve them in creative activities, to ensure their participation in the development of society»¹¹. Inculcating interest in science from an early age, instilling in young people the benefits of the education system was accepted as a methodological part of this work.

The World Academy of Sciences(TWAS) It is an organization that operates as a global academy of sciences based in Trietse, Italy. According to the UNESCO website, TWAS is the world's leading academy of sciences dedicated to the advancement of science in the West¹².It was created in 1983 by a group of scientists led by Pakistani physicist Abdus Salam, a Nobel laureate, to “develop science and engineering to achieve sustainable success in the developing world”. It has more than a thousand members in 90 countries, most of them from developing countries. The original name was the Third World Academy of Sciences, and the current name was given in 2013. Since 1991, it has been operating as a program division of UNESCO. Funded by the Italian government. He has been a member of the International Scientific Council since 1984. It has five regional information services: Egypt, Brazil, China, South Africa, India.

The purpose of TWAS's cooperation with developed countries is:

- Although developing countries make up 80 percent of the world's population, only 28 percent of the world's scientists come from these countries. This situation reflects the lack of innovative opportunities needed to solve real problems in poor countries;
- Chronic research shortages often force scientists in developing countries to become intellectually isolated and ultimately endanger their own countries;
- In developing countries, scientists are paid less, their work is less respected, and as a result, they stop research. The wise in such countries will cause them to leave their country;
- Research institutes are not adequately funded, which forces scientists to work in difficult conditions and often with outdated equipment.

In our opinion, the effective use of human capital in the experience of developed countries can be achieved through the realization of the intellectual potential of talented youth, strengthening the integration of science, education and industry. In particular, the conditions created for talented youth in countries around the world, including Israel, South Korea, the United States, the integration of science and innovation, private educational institutions, the export of intellectual goods, the further development of

¹¹Address of the President of the Republic of Uzbekistan Shavkat Mirziyoyev to the Oliy Majlis. // People's word. December 29, 2018.

¹²World Academy of Sciences (TWAS) | United Nations Educational, Scientific and Cultural Organization.<http://www.unesco.org/new/en/natural-sciences/science-technology/basic-sciences/international-basic-sciences-programme/world-academy-of-sciences-twas/>.

the knowledge economy. For this reason, we believe that in the knowledge economy, it is necessary to improve personnel policy (Figure 1).

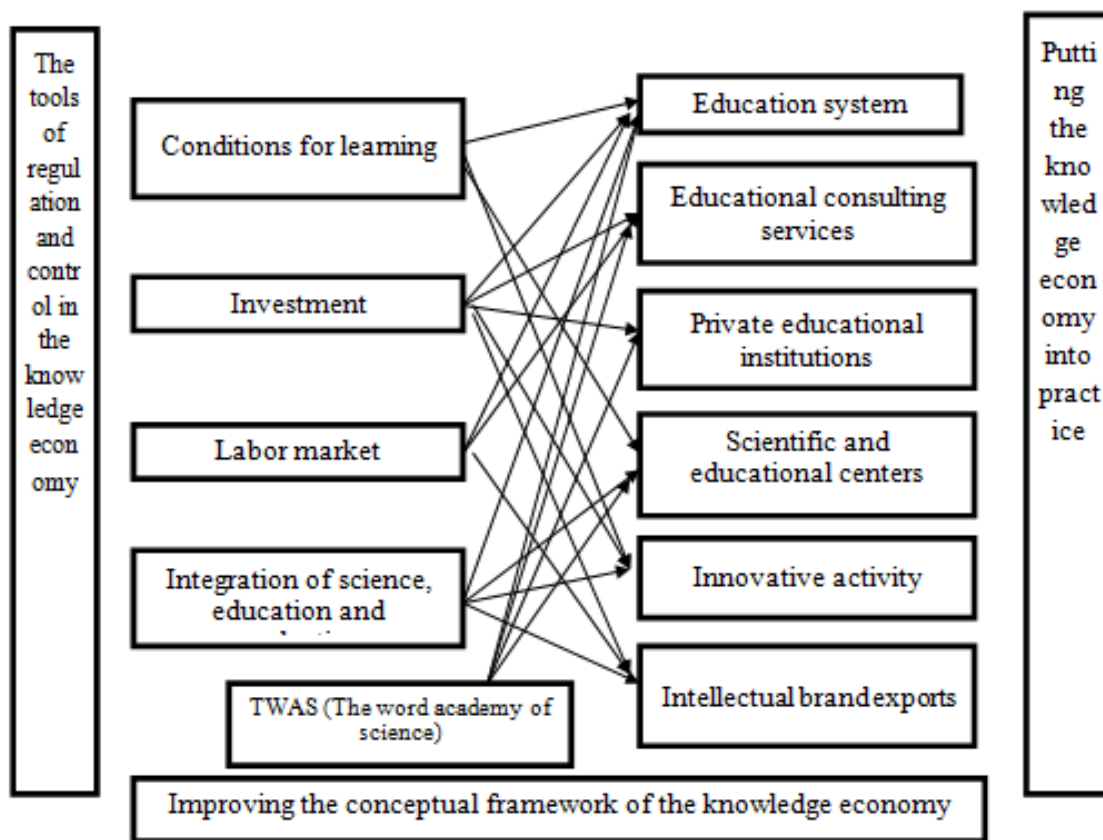


Figure 1. Personnel policy in the knowledge economy¹³

It is the task of any country to identify talented young people early and direct them in the right direction. Therefore, in our opinion, it is necessary to create a single system for them to work with leading scientists, and on this basis to ensure the continuity of the system of training young professionals in science. It is important to create platforms for the implementation of scientific, technical and innovative projects based on the introduction of high technologies in the manufacturing sector and the involvement of young people in research. This implies the creation of training infrastructure by strengthening the integration of platforms: educational consulting services, private educational institutes, scientific education centers. At the same time, educational consulting services, private educational institutes, scientific education centers in the districts provide professional services based on the different interests of students. It will help science to take development to another level and make its field a mature cadre.

The state is well aware of the need to form a regulatory framework for investment in the country, the industry, the introduction of new activities in the field, innovative intellectual inventions. Because they are, first and foremost, bills that establish control over the relationship between market participants in the knowledge economy. In particular, the Law of the Republic of Uzbekistan No. ZRU-42 of July 26, 2006 "On Copyright and Related Rights", among other intellectual protection laws, guarantees the protection of property of any participant in the knowledge economy. Second, incentive laws that create favorable conditions for the development of the knowledge economy have a special place. In this

¹³Compiled by the author.

regard, special attention should be paid to the laws on incentives in the regions. Such bills take into account the individual characteristics of local conditions, allowing to create the necessary conditions for scientific and innovative projects. For example, the bill on the creation of regional venture funds will allow investing in innovative technical and potentially profitable projects.

According to the Global Innovation Index 2020, the index of intellectual workers in business in the country is 22.9, the index of innovative communication is 3.9, the index of knowledge acquisition is 18.9. This indicates that the role of venture capital enterprises in private entrepreneurship has not been realized, and the level of innovation activity is low¹⁴.

We have come to a conclusion by analyzing the number of research and development organizations in Uzbekistan and the sectors in which they operate. We have the following information on research and development in the field of activity in Uzbekistan (Table 1):

Table 1. Number of organizations carrying out research and development work in the field (in units)¹⁵

Years / networks	2012	2013	2014	2015	2016	2017	2018	2019	2020
The total:	313	304	306	323	437	389	668	304	254
including:									
Public sector	146	142	177	183	191	181	289	118	108
Business sector	80	72	34	39	152	121	220	121	79
Higher education sector	85	85	92	92	85	78	146	64	65
Private non-profit sector	2	5	3	9	9	9	13	1	2

It can be seen from Table 1 that among the organizations that have carried out research and development work in the field of activity, the state and business (mainly large monopolized organizations) have begun to carry out research work. This is enough for innovative activity. However, there is a lack of research and experimental design work done in terms of numbers, which is not enough to compete on a global scale. This situation also calls for the integration of science, education and industry.

When we analyzed the costs of research and development work on the sources of funding and areas of activity, we obtained the following table data (Table 2):

Table 2. Expenditures on research and development work by sources of funding and areas of activity (million soums)¹⁶

Indicators	2015	2016	2017	2018	2019
Public sector					
The total:	166250,5	176847,4	192371,4	218546,6	304074,7
Total state budget funds	129290,1	137773,7	144451,7	167263,5	242359,1
Extra-budgetary funds	14378,9	16946,7	3383,0	11268,3	22444,5
Personal funds	14948,8	12148,9	38084,6	29361,1	30019,1
Order funds	6311,3	9681,2	6164,0	9394,0	7333,9

¹⁴The Global Innovation Index 2020: Who Will Finance Innovation? is the result of a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO) as co-publishers, and their Knowledge Partners. 2020. - p. 341.

¹⁵Based on data from the State Statistics Committee of the Republic of Uzbekistan and science and innovation in Uzbekistan. Statistical collection. T. ; 2020. P.45.

¹⁶Science and innovation activity in Uzbekistan. T.: 2020. - P.53-54.

Funds from foreign sources	1311,1	296,9	288,2	1259,7	1918,1
Business sector					
The total:	119080,5	164151,2	176471,8	206687,4	178584,9
Total state budget funds	15163,4	30560,6	28632,4	37004,3	52458,7
Extra-budgetary funds	-	649,6	7409,2	2784,1	1390,0
Personal funds	63416,9	77487,8	92955,5	147262,8	113120,0
Order funds	37463,6	52233,7	45100,7	16328,9	11545,6
Funds from foreign sources	3036,6	3219,6	2374,0	-	70,0
Higher education sector					
The total:	64321,6	82061,7	89765,9	85171,3	104114,4
Total state budget funds	58684,5	73460,8	81292,5	74268,5	95643,7
Extra-budgetary funds	769,9	488,6	1955,5	819,3	1242,2
Personal funds	2712,4	5787,5	5703,7	7061,6	5869,7
Order funds	2154,8	2274,0	814,1	2852,8	1205,6
Funds from foreign sources	-	50,8	-	169,0	153,2
Private non-profit sector					
The total:	4857,6	5425,1	6385,3	6088,0	2803,7
Total state budget funds	4857,6	5425,1	6360,0	5872,7	327,0
Extra-budgetary funds	-	-	-	-	-
Personal funds	-	-	0,3	-	2476,7
Order funds	-	-	25,0	-	-
Funds from foreign sources	-	-	-	139,1	-

From Table 2, we learned that expenditures on research and development work in Uzbekistan by sources of funding and areas of activity are high, around 0.2% of GDP. When we look at spending in various sectors, we can see that the state budget makes up a significant portion of expenditures. This indicates the high activity of the state in the scientific field. This is typical of developing countries.

CONCLUSIONS AND RECOMMENDATIONS

Decree of the President of the Republic of Uzbekistan dated April 1, 2021 No. PP-5047 “On measures to further improve the state policy in the field of science and public administration in the field of innovative development” has very ambitious goals in mind. But we assume that the branches of the economy and the population should also be ready for this.

In our opinion, in order to increase the level of science-intensive products, the following proposals should be introduced:

- a base of scientists and their scientific developments should be created at the Scientific and Practical Center for the Implementation of Innovative Developments under the Ministry of Innovative Development of the Republic of Uzbekistan;
- it is necessary to increase the level of science-intensive products in exports; for this, large-scale industrial complexes of Uzbekistan should increase the share of innovative products;
- integration of the country's universities with production and science while increasing the share of educational innovative products;
- increasing institutional changes in the industry;
- dumping prices for innovative products.

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