ского региона в Казахстан. Перспективы развития уранового рынка тесно связаны с темпами роста мировой атомной энергетики, а в долгосрочном периоде – с развитием технологий как добычи урана, способных удешевить разработку месторождений, так и повторным использованием ядерных отходов при генерации энергии, что может привести к снижению спроса на добываемый уран.

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THE STATE OF THE SCIENTIFIC INFRASTRUCTURE OF KAZAKHSTAN

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An important aspect of the development of innovations is financial support, both from the state and from the private sector. This article will look at education funding, the attractiveness of venture capital and private equity, and the amount of research and development expenditure (R&D) by companies. Kazakhstan spends less on education than all other benchmarking countries. It is necessary to monitor the results of scientific achievements obtained in the framework of the implementation of the policy of industrial and innovative development with the determination of their contribution to the country's economy. In addition, it is necessary to carry out systematic monitoring and evaluation of R&D results for the impact on the country's economy.

Keywords: higher education; R&D expenditure; H-index; benchmarking countries; research specialists.

СОСТОЯНИЕ НАУЧНОЙ ИНФРАСТРУКТУРЫ КАЗАХСТАНА

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Немаловажным аспектом развития инноваций является финансовая поддержка, как со стороны государства, так и со стороны частного сектора. В данной статье будут рассматриваться

финансирование образования, привлекательность венчурного капитала и прямых инвестиций и объем расходов компаний на научно-исследовательские и опытно-конструкторские работы (далее НИОКР). Казахстан тратит на образование меньше, чем все остальные страны бэнчмаркинга. Необходимо провести мониторинг результатов научных достижений, полученных в рамках реализации политики индустриально-инновационного развития, с определением их вклада в экономику страны. Также предлагается провести системный мониторинг и оценку результатов НИОКР на предмет влияния на экономику страны.

Ключевые слова: высшее образование; расходы на НИОКР; индекс Хирша; страны бенчмаркинга; специалисты-исследователи.

Introduction. In the education system, one of the key development priorities is the system of higher education in the Republic of Kazakhstan. One of the key indicators of the country's scientific and technological development is R&D expenditure, which in recent years has remained at a low level in relation to GDP [1].

In Kazakhstan, the largest share of research specialists in the field of R&D is accounted for by universities. Thus, in 2017, there are 8063 research specialists in universities, while in the public sector the number is 5294, in the business sector - 2810, and in the non-profit sector – 1038 research specialists. However, it should be noted that the number of research specialists in universities is gradually decreasing, while in the public sector there is a gradual increase in the number of research specialists [2].

Theoretical analysis of scientific literature, statistical data and periodicals was carried out with the aim of studying the work of foreign and home-based scientists. During the analysis, statistical data of annual reports, documents, statistical and analytical materials of the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. In this regard there is a generally accepted belief that universities often undertake longer-term, higher-risk research activities. As a result, it leads to constitute an essential contribution to a country’s knowledge base and complement the research activities conducted by the private sector [3]. Therefore, universities, particularly certain newly emerged world-class universities, in some developing countries are important for both domestic and foreign firms, specifically for those performing R&D-oriented activities. The funding system for university research in developing universities is usually highly dependent on government fund, and they may show less interest in industry funding due to path dependence, particularly in the case of a rapid increase in government funding to universities.

Methods. In this paper we focus on R&D expenditures on some developing and developed countries. Countries are chosen according to availability of their data.

Results and discussions. In Kazakhstan, the volume of domestic expenditures on R&D increased 6 times in 2003–2017, from 11.6 million tenge in 2003 to 68.8 million tenge in 2017. Among the important measures being undertaken are an increase of government R&D spending by 1 % in GDP by 2025, increasing support for young scientists, the introduction of an annual research grants competition with a requirement for co-funding and the establishment of a special government funding program for the development of research infrastructure [4].

Compared to the benchmarking countries, Kazakhstan occupies the last position in the H-index in almost all areas of scientific activity. Kazakhstan has the lowest values in the H-index in computer science (H-index - 16), mathematics (26), energy (23), and chemical engineering (29). Estonia also lags in this index, but at the same time it ranks higher than Kazakhstan in the ranking (picture 1).

Russia shows much better results in this index: for example, in computer science, the index value is 115, in biochemistry – 254, in energy – 94, and in physics and astronomy – 358. Australia and South Korea are the leaders of this index among the benchmarking countries. Thus, Australia leads in such areas as computer science (280), biochemistry (481), energy (191)

and mathematics (214). South Korea, in turn, leads in chemical engineering (296) and engineering (317).

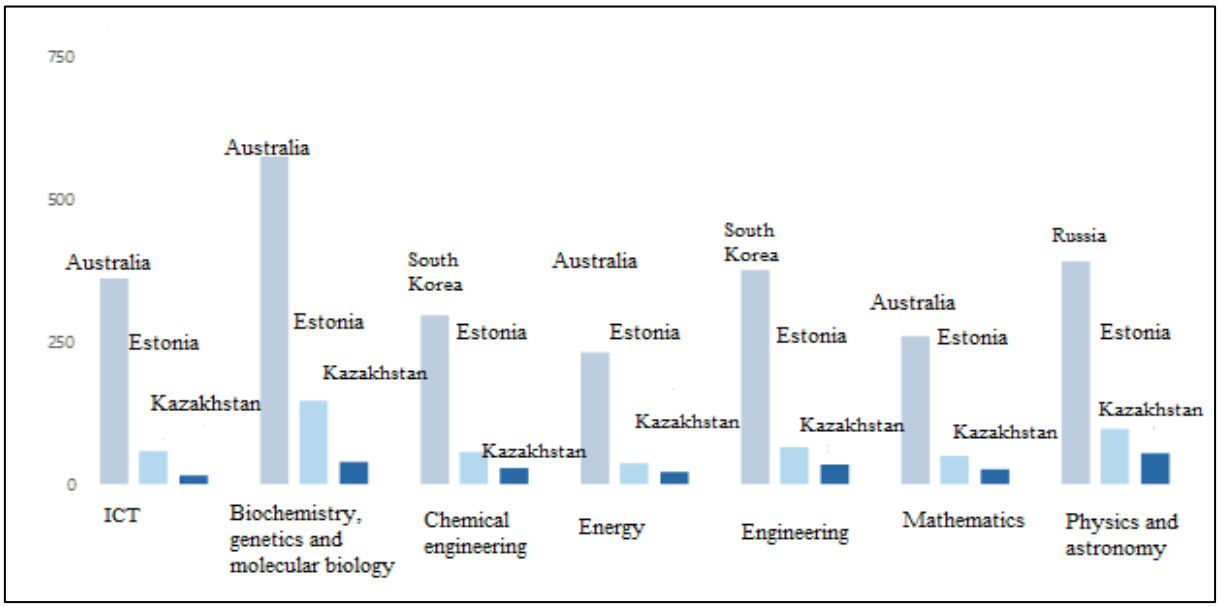

Figure 1 – **Ranking of the H-index by field of science 2018 (with the best and worst benchmarking countries)**

Source: compiled by the authors based on SCImago Journals [5].

Table 1 – **Ranking of Kazakhstan in the H-index by sections in the fields of science 2018 (with the best and worst benchmarking countries)**

Branches of science	Number of materials	H-index	Position	Leading country, position	Last country, position
ICT					
Artificial Intelligence	156	7	95	Australia, 12	Estonia, 75
Digital vision and pattern recognition	81	5	91	Australia, 10	Estonia, 70
Human-computer interaction	63	6	87	Australia, 8	Estonia, 65
Biochemistry, genetics, and molecular biology					
Biochemistry	247	21	113	Australia, 11	Estonia, 49
Genetics	213	19	126	Australia, 9	Estonia, 39
Molecular biology	123	16	123	Australia, 9	Estonia, 46
Biotechnology	198	14	115	Sweden, 11	Estonia, 55
Energy					
Renewable Energy, Sustainability and Habitat	110	11	91	South Korea, 7	Estonia, 70
Mathematics					
Statistics and Probability	133	15	78	Australia, 6	Estonia, 56
Control and optimization	93	6	76	Australia, 8	Estonia, 55
Material sciences					
Nanotechnology and nanoscience	93	14	76	South Korea, 3	Estonia, 69

Source: compiled by the authors based on SCImago Journals [5].

Kazakhstani materials on sections of sciences also occupy lagging positions around the world. The most significant gap falls on the areas of biochemistry (113th place in the H-index),

genetics (126), molecular biology (123), and biotechnology (115). This means that research in the field of medicine and biology is not at all developed in the country. The best positions fall on sections of control and optimization (Mathematics, 76th place in the ranking) and nanotechnology (Material sciences, 76th) (table 1).

Conclusions: One of the main guidelines for the strategic development of the country until 2050 and the Concept for Kazakhstan's entry into the ranks of the 30 most developed countries in the world is the growth of labor productivity [6]. For this, along with the creation of new high-tech sectors of the economy, it is also necessary to form a new generation of labor resources. Thus, to qualitatively improve the practical training of specialists in the system of higher technical education, work should be carried out to develop dual training, create modern centers of applied qualifications to overcome the shortage of personnel.

To fully cover the coverage of opportunities to publish in Scopus journals on a certain basis, it is necessary to provide for lectures for all research staff of institutes, including those providing consulting services. In addition, for Providers of research services funded from public sources (for exceptional research above a closed nature), the preliminary mandatory availability of publications in Scopus journals with an impact factor of 1.

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ТЕНДЕНЦИИ ПРИМЕНЕНИЯ ВАЛЮТНЫХ КОРЗИН: МИРОВАЯ ПРАКТИКА И ОПЫТ НАЦИОНАЛЬНОГО БАНКА РЕСПУБЛИКИ БЕЛАРУСЬ

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В статье выявляются актуальные изменения в формировании национальными банками стран и, в частности, НБРБ, валютных резервов. Анализируются тренды в применении валютных корзин на современном валютном рынке. Представлены возможные варианты пересмотра и видоизменения текущей политики НБРБ в области валютных резервов.

Ключевые слова: валютный курс; валютная корзина; национальный банк; валютные резервы.