

**RECOMMENDATIONS FOR THE INNOVATION-DRIVEN  
DEVELOPMENT OF THE REPUBLIC OF MOLDOVA IN THE  
CONTEXT OF SUSTAINABILITY**

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**Abstract**

*Exploring the relationship between innovation-driven development and sustainability in the Republic of Moldova is a highly topical and important undertaking for scientific research in the present age.*

*The purpose of the present paper is to conduct an analysis of the innovation-driven development of the Republic of Moldova, given that innovation potential is a decisive factor in achieving economic sustainability. In this context, the original contribution was to perform an extensive research based on documentation and comparative analysis, highlighting the positions of the Republic of Moldova, Romania and Ukraine in the Global Innovation Index. The Global Innovation Index is one of the most important reference studies measuring the performance of countries based on innovation. To prepare this paper the following methods were used: induction, deduction, analysis, synthesis, quantitative research, comparative analysis, scientific abstraction, and modelling. Depending on each country's rank, key conclusions and recommendations were drawn for the Global Innovation Index components. A first finding resulting from the analysis is that the Republic of Moldova must make further efforts to use all ideas and inventions and to market them to the final consumer. Another major problem facing the Republic of Moldova is its ranking drop in the sub-index “human capital and research” since it slid from the 71<sup>st</sup> spot in 2014 to 64<sup>th</sup> in 2019 compared to Romania and Ukraine.*

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**Keywords:** *innovation, innovation-driven development, sustainability, Global Innovation Index*

## **1. Introduction**

Practice so far has shown that not all countries need to be leaders in the global technological development race, however their innovation capacity must be relevant and constitutes the highest level of technological capacity.

*Most often innovation stems from applied research (and sometimes even from fundamental research), continues with design and implementation in practice (which is the most expensive phase), and ends with manufacturing and sale to users. Beyond research and design, the successful completion of the project involves, in practice, the collaboration of all units of an organisation.*

Most often we talk about “creativity and innovation”, on the one hand because they condition each other, finding answers to all the problems that emerge in an innovation process requiring creativity, and, on the other hand, because the two activities most often need the same conditions to develop within an economic organisation. Innovation is considered the equivalent of a level three invention, on a value scale from one to five. In order for the *creativity process* to unfold in good conditions, the following is required [1; p. 38]:

- *good circulation of information* (finding the disparate elements that need to be converge).
- *good knowledge of the market and its requirements;*
- *close contact with the research community* (source of new knowledge in the fundamental field);
- *accepting the “out of the ordinary, strange” ideas*, whose proponents are very fond of;
- *creating small teams, each made of several very open-minded (inventive)members;*
- *properly motivating those who are concerned with creativity;*
- *providing “training” in the area of creativity.*

Innovation is further conditioned by a number of specific factors, such as:

- *clear strategy;*
- *clearly formulated objectives;*
- *proper financing, doubled by sound management of the entire innovation activity;*
- *the existence of a competent team that can solve the problems that appear throughout the course of the new project;*
- *the existence of a clear and correct procedure for evaluating the results and work of employees;*
- *the existence of a competitive climate, both inside and outside the organisation.*

Intellectual property has a long history, originating in human creation, due to humans’ tendency to develop working tools, to improve living conditions and to satisfy vital needs that are constantly growing and improving.

Human creation is a product of the human intellect that emerges in the subconscious, seeking to solve problems that have already arisen or might arise in the future. The creative process cannot be stopped or subjected to quantitative or qualitative norms, as it is triggered by the environment in connection with a person’s ability to perceive this environment, in any particular way.

The impossibility of interfering in human thinking to control its outcomes, in addition to the need to safeguard such outcomes, which forms the object of intellectual property, has contributed to the emergence of legal rules designed to regulate the procedure for obtaining protection of intellectual property over objects, setting certain criteria in particular as regards material form and content, absent which the notion of object of intellectual property and its protection could not exist.

## 2. The extent of research into the matter

Innovation-driven development is a necessity and one of the fundamental factors in the new economy. The Moldovan, Romanian and Ukrainian societies, respectively, are advancing towards a knowledge-based economy, an economy in which *the use of human capital takes the priority compared to other forms of capital*. The contribution that a person can make by applying in practice the skills they acquired in order to improve processes, products and services becomes more important than physical work. Knowledge incorporated in a product will become a key element of economic activities. The European Commission's "Innovation & Technological Transfer" paper defined innovation in October 2012 as the "*Converting new knowledge into economic and social benefits, as a result of complex interactions between numerous actors in a system consisting of an environment (local, national, regional) which involves businesses, research bodies, financial backer, as well as the networks in which all of them come into contact*". An innovation process is a systematic, general process involving four phases:

- *formulating a scientifically-grounded idea (generated by creative spirit, inspiration, copying, research and development);*
- *industrial transposition through a skilled research-industry (preferably private) partnership, involving financing and a certain technological process, a new form of presentation, a new functional structure, a new organisational form, new work management and organisation methods etc;*
- *robust, efficient and extensive protection of intellectual property elements;*
- *the successful market impact of the end result of the innovation process (a new product or service, a new form of presentation, a new functional structure, a new organisational form, new work management and organisation methods, etc.) through a capitalisation network, national and/or international.*

According to the Organisation for Economic Co-operation and Development (OECD), innovation is the creation of a newproduct-market-technology-organisation-combination. This definition suggests that there are three key elements [17; p. 139]:

- *innovation is a process and should be managed as such.* The key activities in innovation management are: formulating objectives, designing and organising the process, monitoring progress and, if necessary, adjusting objectives, process and / or organisation.
- *the result is at least a new element in the technology mix of the organization.* Product innovation, for example, involves the development, production and marketing of new products and may require the development of new process technologies or market segments. Technological innovation, i.e. the development of new process technologies in the household or the adoption and implementation of technologies developed elsewhere usually also requires organisational adaptation, but does not need to be related to new products or new market development.
- *the extent to which innovation is new can range from progressive, limited gradual innovation, achieved through synthetic innovation, i.e. the creative recombination of existing techniques, ideas or methods, to discontinuous, radical innovation.*

Ensuring sustainability has already begun to transform the competitive landscape and force economies to rethink products, services, processes and business models. This requires innovation, considered the key to progress. Sustainability is seen as the new frontier of innovation, and both exert a major impact. Sustainability is a concept focused on achieving human development goals while simultaneously supporting the capacity of ecosystems by providing natural resources and protecting life and nature, without diminishing opportunities for future generations.

This is a significant concept in ensuring social and economic development, first defined by the United Nations World Commission on Environment and Development (WCED) in 1987.

The “Our Common Future” report defined “*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*” [14; p. 49].

WCED sought to explore the causes of environmental degradation, as well as the interconnections between social equity and economic growth. Sustainability objectives integrate the three economic, social and environmental aspects to ensure the development of future generations. In view of current activities at international level, the United Nations Agenda for Sustainability was adopted in 2015 based on the document “Transforming our world: the 2030 Agenda for Sustainable Development”. The New Sustainability Goals, targeting the year 2030, emphasise, among others, the relevance of higher education in efforts for a better future [14; p. 51].

The inclusion of UN sustainability goals in the curriculum will support the development of future-oriented skills. This can be achieved by promoting social, economic and political change, which can be supported by professional leaders and experts.

Recent developments also show that the European Union’s *Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth*, adopted in 2010, emphasises the crucial importance of innovation, education, the digital society, training and lifelong learning in this context [16].

According to the Global Action Programme on Education for Sustainable Development, adopted by UNESCO in 2014, one can argue that political agreements, financial incentives and modern technologies are not enough to achieve sustainability.

The sustainable university harmoniously combines education and research in a complex process of ensuring an interdisciplinary balance in the context of optimal use of the natural, social and economic environment by collaborating with stakeholders involved in the process.

According to Velazquez’s definition, a sustainable university always focuses on the environmental, economic and social concerns of its activities and the obligation to “lead by example”. The researcher states that “a university should minimise the ecological, economic, social and health effects on the environment”. Cole contends that “*a university has a responsibility to protect the health and welfare of people and ecosystems and to use the knowledge produced in the university to address environmental and social challenges*” [4, p. 814].

On the other hand, the illustrious researchers Alshuwaikhat and Abubakar state that “*the effort to conserve energy and resources, reduce waste, promote social justice and the notion of equity, must be transferred to society*” [5; p. 178].

From the theoretical approaches presented, we observe the urgent need to provide a sustainable and balanced development of higher education institutions in order to ensure a synergy of sustainable development of the whole society.

### 3. Applied methods and materials

*The aim of this research* is to conduct an analysis of the innovation-driven development of the Republic of Moldova in the context of achieving sustainability, considering that innovation potential is a decisive factor in achieving economic sustainability. In order to obtain valid results from the research, in addition to the aim of the research, it was necessary to define several objectives, focusing on the attributes necessary for the research.

The *objectives* set to achieve our goal are the following: researching the relevant literature (documentary research of local and foreign literature); obtaining the necessary information by conducting complex research using statistical data for 2020; provided by the National Bureau of Statistics; statistical and mathematical modelling; comparative analysis.

The *research methodology* focused on the use of research methods such as analysis, synthesis, induction, deduction, comparative analysis, documentation, scientific abstraction, mathematical modelling.

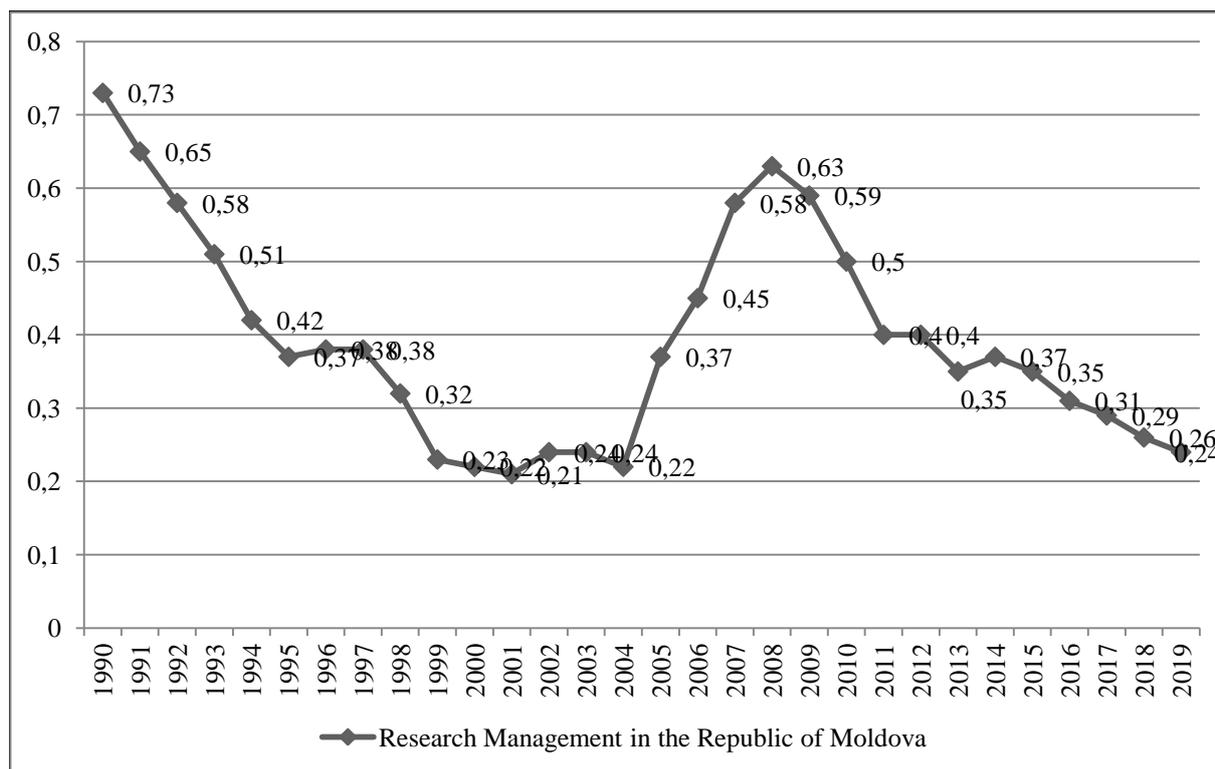
### 4. Obtained results and discussions

*Intellectual property* refers to the creations of the mind: inventions (patents), literary and artistic works, symbols, names, images, designs, used in commercial activities. The owner of intellectual property can control and must be rewarded for its use, as this encourages innovation and creativity for the benefit of humanity [19; p. 54].

During the first transition period (1990-1999), the GDP of the Republic of Moldova decreased by 64%. During this period, public funding for research and development fell sharply from 0.73% of GDP in 1990 to 0.22% in 2004 (exacerbated by a sharp decline in GDP). Funding returned to 0.6% of GDP in 2008 and fell again to 0.4% in 2011 and 0.37 in 2014, due to the international economic and financial crisis that imposed new constraints on the national public budget [16].

In recent years, the share of GDP allocated to the R&D sector has decreased from 0.37 in 2014 to 0.35 in 2015 and to 0.24 in 2019 (Figure 1). This has had a negative influence on the country's innovation-driven development as most of the expenditure for the research and development sector is derived from research grants.

Innovation activity is highly complex and includes a series of other activities in the scientific, technical, technological, organisational, financial, commercial areas, etc. It concerns both the use and marketing of scientific research results, as well as the diversification, efficiency and improvement of the manufacturing quality of goods and services, the improvement of manufacturing technology, followed by its efficient implementation in domestic and foreign markets.



**Figure 1. Research Management in the Republic of Moldova, % share of GDP**

Source: National Statistical Bureau, 2020

<https://statistica.gov.md/newsview.php?l=ro&idc=168&id=6541>

The issue has been addressed in various seminar and symposia, and numerous studies have been conducted both nationally, in different countries and internationally aiming to highlight the problems that persist in the area of innovation. All of them more or less complete analyses of the innovation systems, or of some aspects related to the innovation activity and highlight both the deficiencies and ways to foster the innovation process.

For the Republic of Moldova, the experience of countries that are relatively in the same socio-economic and cultural situation is of interest in this respect. Thus, one research on barriers to bringing to the market the research results in Ukraine led to the following preliminary conclusions: the main cause of the emergence of such barriers is the lack of a systemic approach to innovation in general and its management at all stages of the innovative product life cycle - from the birth of the innovative idea up to deriving profit from innovation, in particular. At least 50 barriers to the transformation of research results into innovative products were identified, estimated on a five-point scale. The barriers were systematised in five large groups, having approximately the same incidence on the innovative activity:

- *lack of competence of the subjects of the innovation activity* ( $3.68 \pm 0.84$ );
- *insufficient funding of innovation* ( $3.67 \pm 0.71$ );
- *shortcomings of the legal framework for innovation* ( $3.52 \pm 0.87$ );
- *lack of proper innovation infrastructure* ( $3.39 \pm 1.00$ );
- *inefficient innovative management* ( $3.31 \pm 1.01$ ).

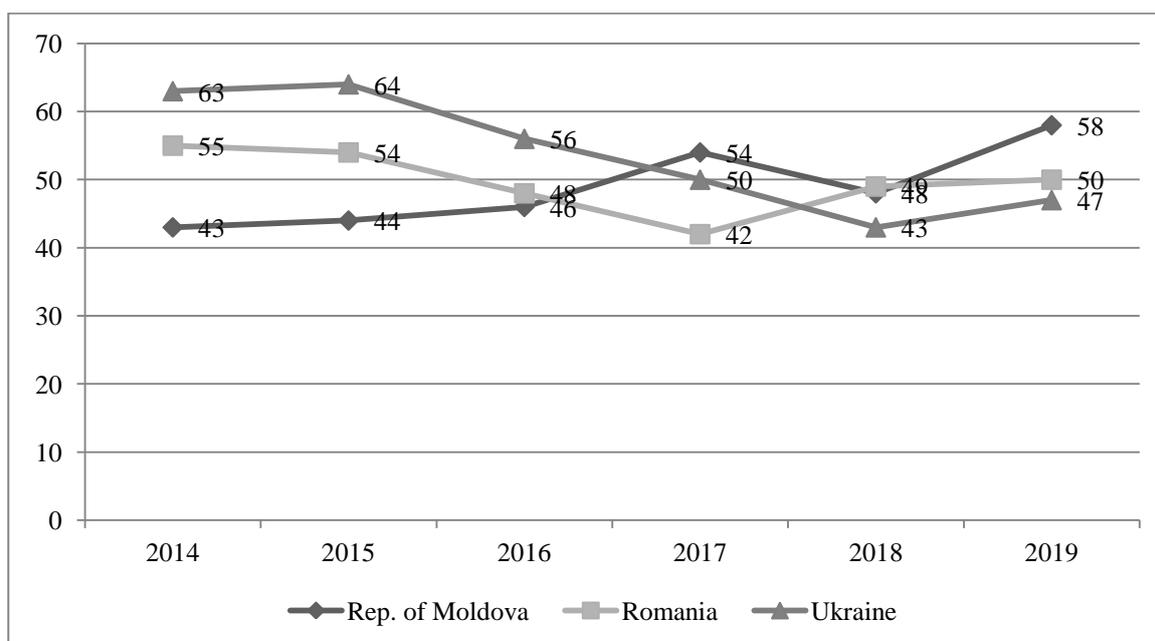
The most important group of barriers refers to the lack of skills of innovation subjects in terms of marketing their research results. According to the authors, this is precisely where the work of dismantling and further removing existing barriers should begin [16].

In terms of companies' contribution to the development of an innovation, several categories of businesses can be identified as providers of innovations:

- dominated supplier – a company that contributes minimally through its own research, preferring to import new technological elements;
- intensive supplier – a company that contributes noticeably to innovations through its own research;
- specialised supplier – a company that focuses on generating new complementary innovative products (which contribute to the manufacturing process of its core product) to be used in other sectors;
- scientific suppliers – companies that develop new innovative products in partnership with institutions in the field of science and innovation;
- information and capital providers – companies in the areas of finance, retail and editing / publishing;
- software providers – companies that develop innovative information technology products used in the process of manufacturing and / or providing services [16].

To calculate the Global Innovation Index, 143 economies from around the world were studied, using 81 indicators including: human capital and research, infrastructure, loans, investments, interconnections, innovation and the results of creative activity. According to these metrics, the Republic of Moldova accumulated 40.5 points out of 100.

In order to identify the dynamics of the components of the Global Innovation Index and to reiterate the most suggestive developments, we performed an analysis of the sub-indices of the Global Innovation Index of the Republic of Moldova, Romania, Ukraine for the 2014-2019 period. Figure 2 shows the dynamics of the Global Innovation Index in a cross-border context in 2014-2019.



**Figure 2. Dynamics of the Global Innovation Index in the cross-border context of the Republic of Moldova, Romania and Ukraine for the 2014-2019 period**

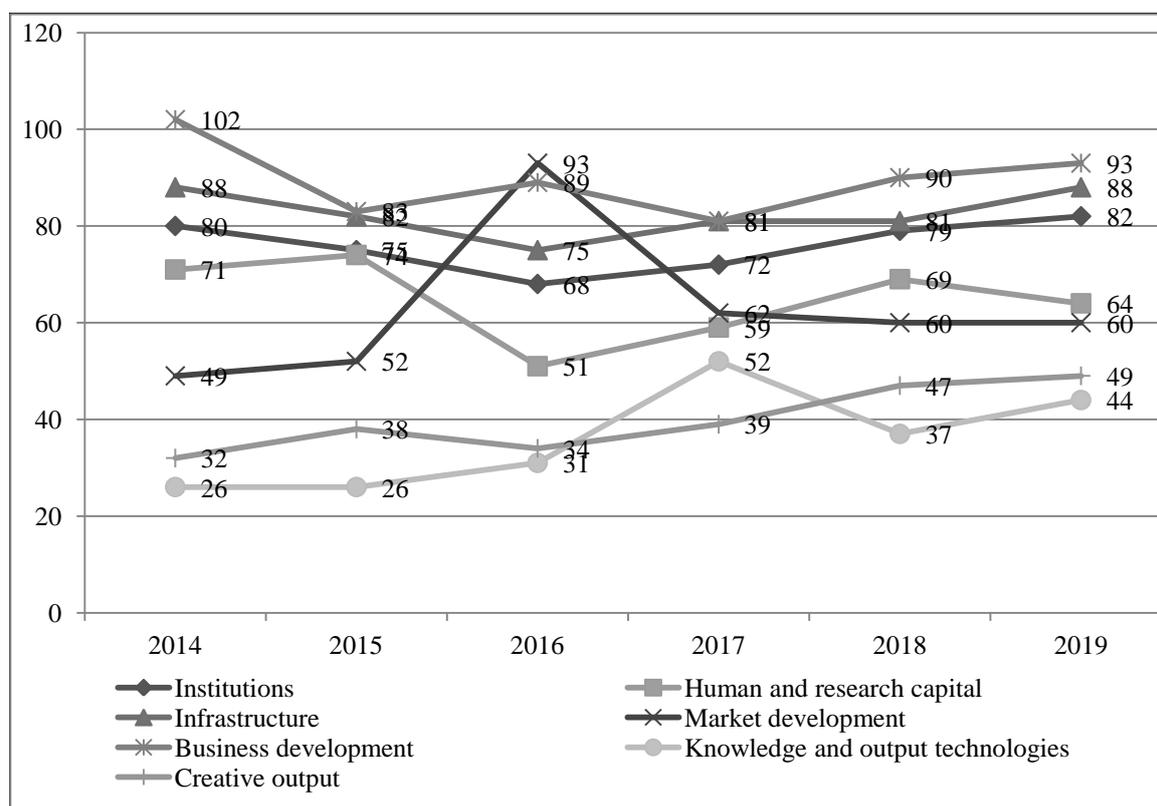
Source: Developed based on the Global Innovation Index reports, 2014-2019.

[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

Based on the data in Figure 2, we can note that the Republic of Moldova underwent practically the same evolution trend as Romania and Ukraine, ranking closely in the Global Innovation Index in the 2014-2019 period. Thus, analysing Moldova's rankings, we can notice that over the analysed period, by 2019, ranked 58<sup>th</sup>, it had lost 15 spots compared to 2014. On the other hand, Romania in the 2014-2019 period improved its standing by climbing 5 spots from 55 in 2014 to 50 in 2019.

On the other hand, Ukraine, in the 2014-2019 period proposed for analysis, climbed 15 spots in the ranking from the 63<sup>rd</sup> place in 2014 to the 47<sup>th</sup> in 2019. In this context, we note that the countries neighbouring Moldova had a positive development, gaining places in the overall ranking of the Global Innovation Index. Conversely, Moldova, in recent years, due to the instability of policies applied at state-wide level, has lost several places, recording a declining trend over the 2014-2019 period.

We considered it useful to present the dynamics of the basic sub-indices that contribute to the formation of the Global Innovation Index in the 2014-2019 period for the Republic of Moldova. We presented the data schematically in Figure 3.



**Figure 3. Dynamics of the core sub-indices that contribute to the Global Innovation Index of the Republic of Moldova for the 2014-2019 period**

Source: Developed based on the Global Innovation Index reports, 2014-2019

[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

Analysing the key sub-indices of the Global Innovation Index for the Republic of Moldova over the 2014-2019 period, we can see that its ranking declined for virtually all the sub-indices that make up the Global Innovation Index. Thus, in the first sub-index, "institutions", the Republic of Moldova in 2019 occupied place 82 and lost 2 positions compared to 2014.

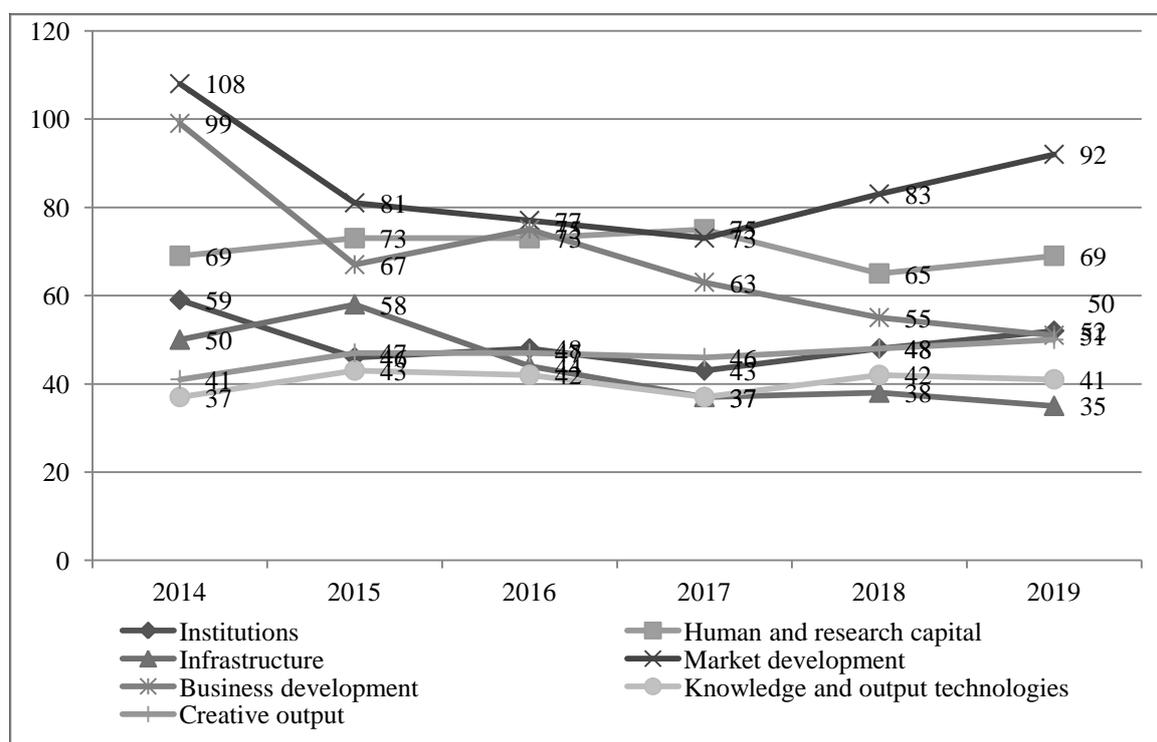
On the other hand, in the sub-index “infrastructure”, although during the period under analysis the values of this sub-index changed essentially, the Republic of Moldova kept the 88<sup>th</sup> spot which it had occupied in 2014. As for the “business development” index, the Republic of Moldova in the reference period 2019 held the 93<sup>rd</sup> spot, having climbed 9 places compared to 2014 when it was ranked 102<sup>nd</sup>.

As regards the sub-index “human capital and research”, the Republic of Moldova climbed 7 positions in the 2014-2019 period from the 71<sup>st</sup> spot achieved in 2014 to 64 in 2019. This is gratifying and demonstrates the effects of efforts to develop the education and research sector.

On the other hand, in terms of the dynamics of the sub-index “market development”, the Republic of Moldova in the 2014-2019 period lost 11 places in the ranking, being placed 60<sup>th</sup> in 2019 compared to 49<sup>th</sup> in 2014.

The sub-index “knowledge and input technologies” in the 2014-2019 period underwent a negative evolution losing 18 spots in the ranking, dropping from the 26<sup>th</sup> spot occupied in 2014 to the 44<sup>th</sup> spot in 2019. Improvements are needed in this sector and further efforts to strengthen the position of the Republic of Moldova.

In addition, we presented briefly Romania’s positions in the Global Innovation Index ranking over the 2014-2019 period so as to perform a comparative analysis. The data are shown in Figure 4.



**Figure 4. Dynamics of the core sub-indices that contribute to the Global Innovation Index of Romania for the 2014-2019 period**

Source: Developed based on the Global Innovation Index reports, 2014-2019

[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

Analysing the data summarised in Figure 4, we can note that in the 2014-2019 period Romania’s efforts were directed towards improving its ranking position, consequently the

values of the sub-indices rose. If we consider the first sub-index, “Institutions”, we can reiterate that Romania climbed 49 spots in the ranking to the 50<sup>th</sup> place in 2019 compared to 99 in 2014. Another spectacular development for sub-index “infrastructure” where in analysed period, Romania climbed 10 spots, being ranked 97<sup>th</sup> in 2019.

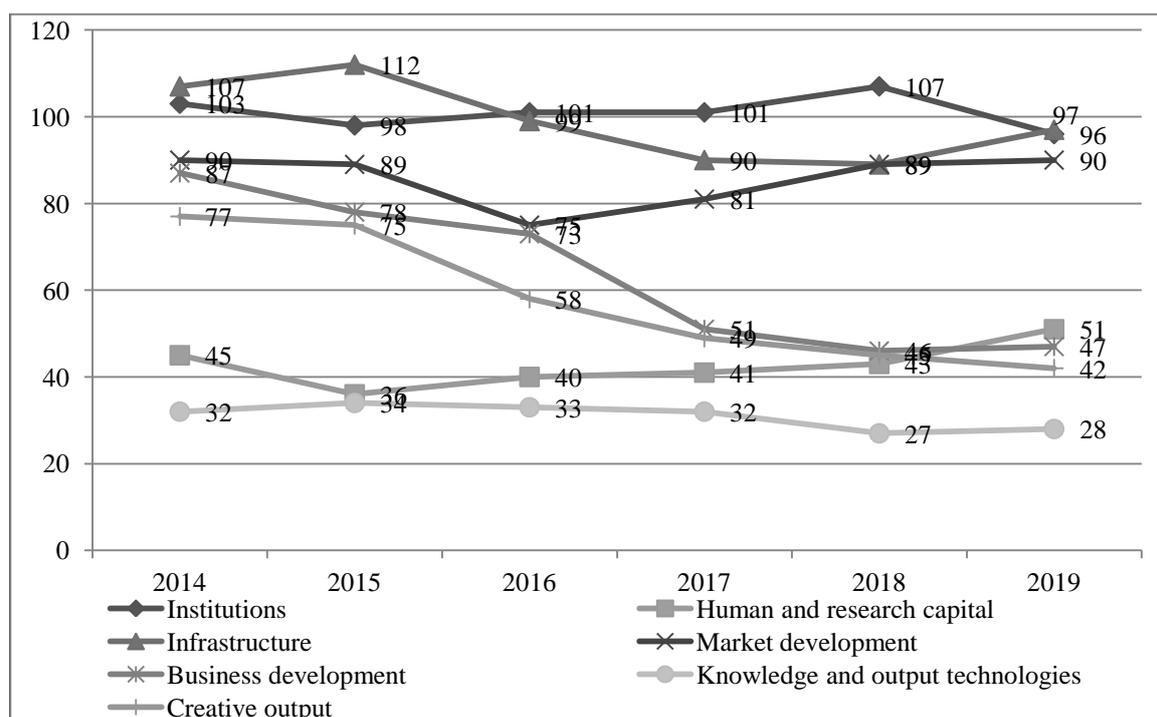
As regards the “business development” sub-index, Romania in the 2014-2019 period saw a spectacular rise in the ranking from 87<sup>th</sup> spot in 2014 to 47 in 2019.

Also, there was a stabilisation of Romania’s position in the sub-index “market development” where in the 2014-2019 period Romania remained at the 90<sup>th</sup> spot.

In addition to these spectacular increases, Romania saw a decrease in the sub-index “human capital and research” as in the 2014-2019 analysis period it lost 6 places occupying the 51<sup>st</sup> spot in 2019 compared to 45 in 2014.

A decrease in the ranking of Romania is also noticeable in the sub-index “knowledge and output technologies” where it lost 4 spots, placing 41<sup>st</sup> in 2019 compared to 37 in 2014.

Ukraine’s ranking in terms of the dynamics of the sub-indices of the Global Innovation Index for the 2014-2019 period is presented in Figure 5.



**Figure 5. Dynamics of the core sub-indices that contribute to the Global Innovation Index of the Ukraine for the 2014-2019 period**

Source: Developed based on the Global Innovation Index reports, 2014-2019

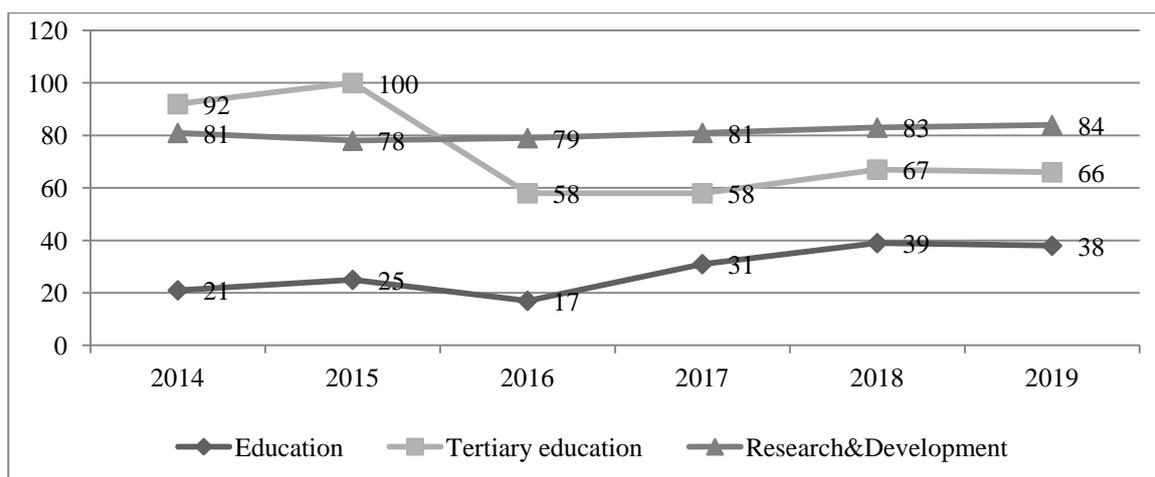
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Analysing the data in Figure 5, we may see that Ukraine in the 2014-2019 period consolidated its positions in virtually all sub-indices analysed by us. Thus, in the analysed period Ukraine saw spectacular growth regarding the sub-index “business development”, with a rise from the 87<sup>th</sup> spot in 2014 to 47 in 2019. In addition, Ukraine had spectacular growth in the “institutions” sub-index from 103 in 2014 to 96 in 2019.

Moreover, Ukraine saw spectacular increases regarding the “infrastructure” sub-index from 107 in 2014 to 97 in 2019. Also, in the creative output sub-index Ukraine rose from 32 in 2014 to 28 in 2019.

In the human capital and research sub-index, Ukraine saw a decrease in the 2014-2019 period from 45 in 2014 to 51 in 2019, losing 6 positions.

Next, we will provide a comparative analysis of the evolution of the basic components of the human capital and research sub-index for Moldova. The data are summarised in Figure 6.



**Figure 6. Evolution of the components of the sub-index Human capital and research in the cross-border context of Moldova, for the 2014-2019 period**

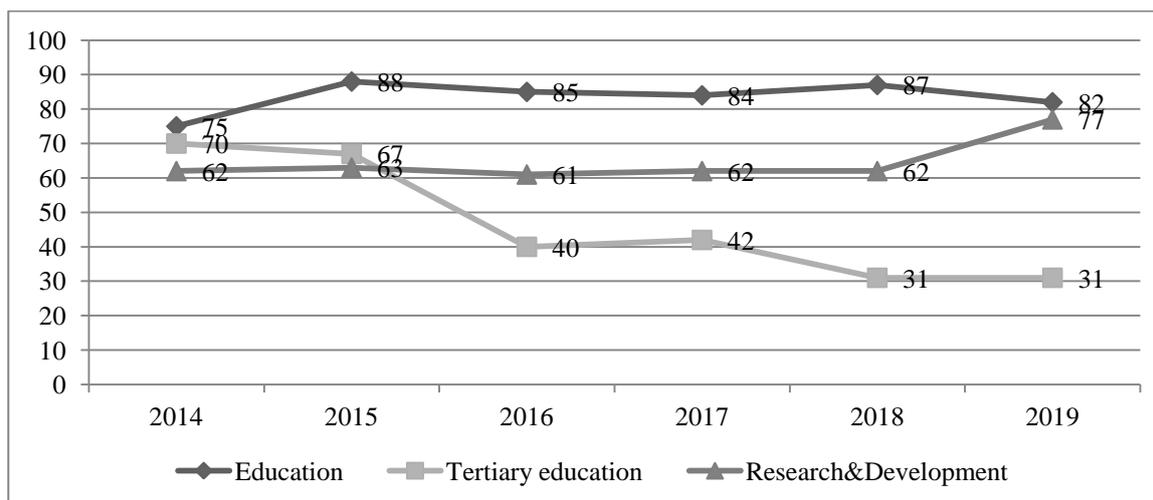
Source: Developed based on the Global Innovation Index reports, 2014-2019

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The analysis of the components of the human capital and research sub-index of Moldova for the 2014-2019 period shows that Moldova lost 16 positions in the “education” component, placing 38<sup>th</sup> in 2019 compared to 21<sup>st</sup> in 2014. On the other hand, in another component of human capital and research, i.e. “tertiary education” Moldova saw a rise of 26 place in the rankings being placed at 66 in 2019 compared to 81 in 2014. Moldova also saw a declining trend in the research-development component where in the 2014-2019 period it lost 3 spots, ranking at 84 in 2019 compared to 81 in 2014. The dynamics of the components of the human capital and research sub-index for Romania is summarised in Figure 7.

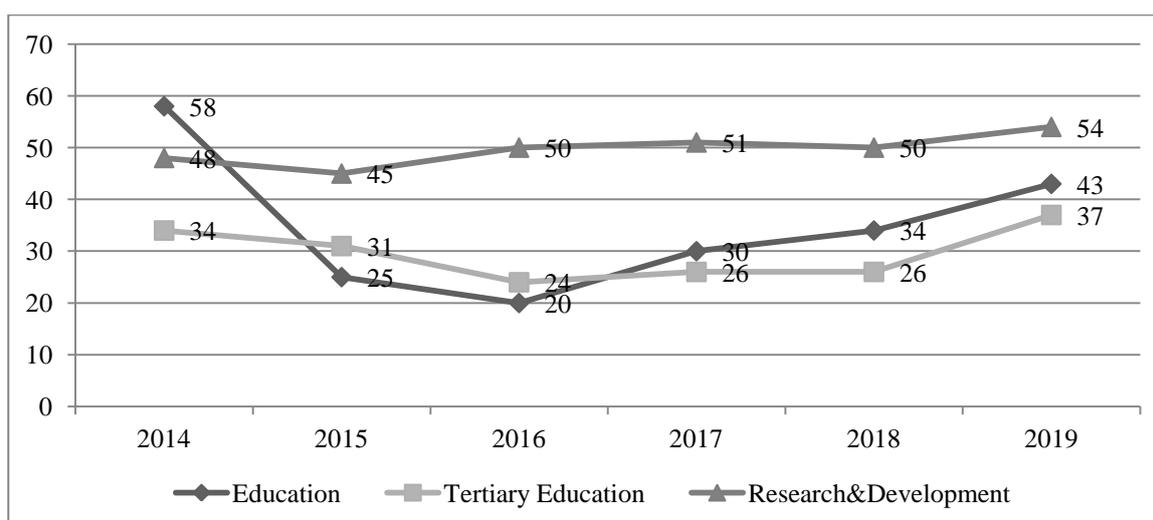
Analysing the components of the “human capital and research” sub-index for Romania, we notice that in the 2014-2019 period Romania climbed 39 positions in terms of the “tertiary education” component, being placed in the 31<sup>st</sup> spot in 2019 compared to 70 in 2014.

In addition, for the two other components, Romania dropped in the rankings during the analysed period. Thus, in the “education” component, in the analysed period, Romania lost seven positions in the ranking from 75 in 2014 to 82 in 2019. In the other component, “research and development”, Romania in the analysed period lost 15 places, ranking in 2019 at 77 compared to 62 in the year 2014. The dynamics of the components of the human capital and research sub-index for Ukraine is summarised in Figure 8.



**Figure 7. Evolution of the components of the sub-index Human capital and research in the cross-border context of Romania, for the 2014-2019 period**

Source: Developed based on the Global Innovation Index reports, 2014-2019  
[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)



**Figure 8. Evolution of the components of the sub-index Human capital and research in the cross-border context of Ukraine, for the 2014-2019 period**

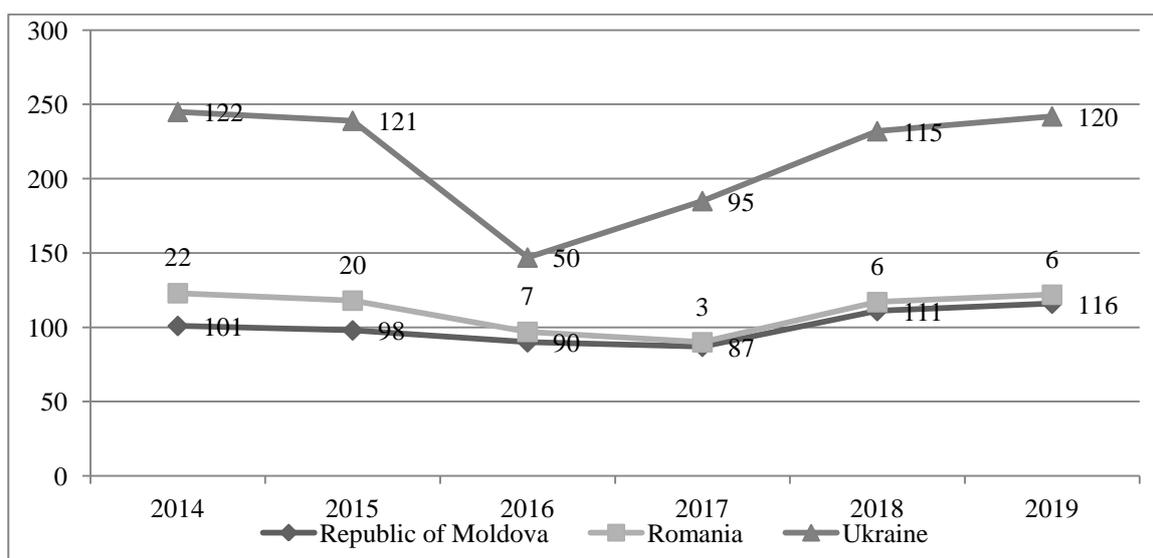
Source: Developed based on the Global Innovation Index reports, 2014-2019  
[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

Analysing the dynamics of the components of the “human capital and research” sub-index of Ukraine in 2014-2019, we can note that Ukraine in this period saw an upward trend in the “education” component rising from the 58<sup>th</sup> place in 2014 to 43<sup>rd</sup> in 2019. In the other two “tertiary education” components, Ukraine lost three places from 34 in 2014 to 37 in 2019. In the “research and development” component, Ukraine lost six spots going from 48 in 2014 to 54 in 2019.

Through the comparative analysis of all three components of the “human capital and research” sub-index we can highlight that for the “education” component Moldova was best placed in the ranking in 2019 at 38, while Romania held the lowest position at 83.

In the “tertiary education” component in 2019 among the three analysed countries, Romania ranked best at 31, while Moldova ranked lowest at 66.

In the “research and development” component, in 2019, for the three analysed countries, Ukraine ranked best at the 54<sup>th</sup> spot, Moldova placing lowest in the 84<sup>th</sup> position in the ranking. Next, we will provide a summary presentation of the rankings of Moldova, Romania and Ukraine in terms of the environmental sustainability component of the Global Innovation Index for the 2014-2019 period. The data are summarised in Figure 9.



**Figure 9. Ranking of Moldova, Romania and Ukraine in terms of the environmental sustainability component in the Global Innovation Index for the 2014-2019 period**

Source: Developed based on the Global Innovation Index reports, 2014-2019

[https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2019.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf)

The comparative analysis of the ranking of Moldova, Romania and Ukraine in the “ecological sustainability” component of the Global Innovation Index for 2014-2019 indicates that Moldova in this period recorded a drop in rankings of 15 places, from 101 in 2014 to 116 in 2019.

On the other hand, Ukraine during this period saw a slight improvement in the ranking from 122 in 2014 to 120 in 2019.

One ought to emphasise the spectacular improvement of Romania during the 2014-2019 period of as it climbed 16 places, being one of the leaders in the ranking at the 6<sup>th</sup> spot in 2019.

## 5. Conclusions

Innovation is a process of uniqueness that involves research, funding, development, acceptance and demand by customers, profit making and dissemination of results. Innovation “represents a result, being the finality of the innovation process”. The purpose of this research was to conduct an analysis of competitiveness at country level, recognising the fact that the innovation potential is a decisive factor in achieving economic sustainability. In this context,

the original contribution was to conduct extensive research based on the documentation and analysis of the position of the Republic of Moldova in the Global Innovation Index. The Global Innovation Index is one of the most important reference studies measuring the performance of countries based on innovation.

In conclusion, we may note that a major problem still confronting the Republic of Moldova is that very few of the creations, ideas and inventions that are created end up as a new product presented to the final consumer. Accordingly, we can argue, based on the research results that the Republic of Moldova faces major problems in the “market development” respectively “knowledge and output technologies” sub-indices, respectively. The Republic of Moldova must make further efforts to use all ideas, inventions and market them to the final consumer. One needs therefore to strengthen efforts to improve the position of the country in these areas.

Another major problem confronting Moldova is the decrease in the ranking in terms of the “human capital and research” sub-index where it slid from 71<sup>st</sup> spot in 2014 to 64<sup>th</sup> in 2019 compared to Romania and Ukraine. The Republic of Moldova has a special human potential that can be capitalised in the context of ensuring the increase of competitiveness of the domestic economy. It is necessary to foster the development of the sectors of the economy by orienting them towards sustainability in order to increase the quality of life in the country, but also in order to achieve a sustainable development of the domestic economy. It would be beneficial to implement cross-border projects, to collaborate in order to learn from the experience of Romania and Ukraine as Moldova country is less well placed in terms of the analysed indicators. It is necessary to implement sustainability strategies and policies in the development of the domestic economy that would ultimately contribute to the development of the country’s human potential.

Considering the importance of promoting the profit-generating advantages of the protection and capitalisation of intellectual property rights, we consider that the following are required:

- currently in the EU Member States and not only, the emphasis on this form of collaboration is quite strong, which would also be recommended to the Republic of Moldova;
- the contribution of scientific research in higher education to the development of the business environment is a permanent objective that justifies any efforts;
- the cooperation of universities and research centers with SMEs must be in line with the economic, social and political transformations of Romania, Ukraine and the Republic of Moldova;
- economic progress is achieved exclusively through the development of Moldovan, Romanian and Ukrainian research (which also includes university research);
- creating a favourable environment for starting and developing innovative businesses;
- extracting from the research effort the maximum innovative benefit, at the level of each SME but also more generally;
- identifying obstacles to the innovation process, characterising these obstacles and determining ways to remove them.

Obviously, such a presentation does not aim to exhaustively cover the topic of innovation or to find solutions to current innovation problems, yet it can open up several avenues along

which beneficial discussions can begin between all those interested the progress through innovation of the Republic of Moldova, Romania and Ukraine.

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### Rezumat

*Abordarea unei teme privind dezvoltarea inovațională a Republicii Moldova în contextul atingerii sustenabilității, reprezintă un demers de mare actualitate și importanță pentru cercetarea științifică în etapa actuală.*

*Scopul cercetării în prezenta lucrare este efectuarea unei analize proprii privind dezvoltarea inovațională a Republicii Moldova, dat fiind faptul că potențialul inovațional este factor decisiv în atingerea*

sustenabilității economice. În acest context, contribuția originală a fost efectuarea unei ample cercetări pe baza documentării și analizei comparative, în care au fost evidențiate pozițiile Republicii Moldova, României și Ucrainei la Indicele Global de Inovare. Indicele Global al Inovației este unul dintre cele mai importante studii de referință pentru măsurarea performanței țărilor în baza inovării. Pentru a elabora această lucrare am utilizat în calitate de metode: inducția, deducția, analiza, sinteza, cercetarea cantitativă, analiza comparativă, abstracția științifică, modelarea. În funcție de pozițiile ocupate au fost trasate cele mai importante concluzii și recomandări pentru fiecare țară în parte la componentele Indicelui Global de Inovare. O prima constatare ce rezultă din aceasta analiză este că Republica Moldova trebuie să mai depună eforturi în vederea utilizării tuturor ideilor, invențiilor și a scoaterii lor pe piață, în fața consumatorului final. O altă problemă majoră a Republicii Moldova este descreșterea în clasament la sub-indicele „capital uman și de cercetare” unde a pierdut pozițiile de la 71 în 2014 la 64 în 2019 comparativ cu România și Ucraina.

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**Cuvinte-cheie:** inovații, dezvoltare inovațională, sustenabilitate, indicele global de inovare

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#### **Аннотация**

На данном этапе научных исследований тематика инновационного развития Республики Молдова в контексте достижения устойчивости является особенно актуальной.

Цель исследования авторов заключается в проведении анализа инновационного развития Республики Молдова, учитывая, что инновационный потенциал является решающим фактором в достижении экономической устойчивости. Посредством документирования и сравнительного анализа выявлены позиции Республики Молдова, Румынии и Украины в отношении Глобального индекса инноваций. Глобальный индекс инноваций позволяет провести важные справочные исследования для измерения достижений стран на основе инноваций. В процессе разработки статьи авторами использованы методы: индукция, дедукция, анализ, синтез, количественное исследование, сравнительный анализ, научная абстракция, моделирование. В зависимости от уровня показателей были сделаны надлежащие выводы и рекомендации по компонентам Глобального индекса инноваций для каждой страны. Первый вывод, сделанный в результате этого анализа, заключается в том, что Республика Молдова должна прилагать дальнейшие усилия для использования всех идей, изобретений и их сбыта конечному потребителю. Другой серьезной проблемой Республики Молдова является снижение рейтинга страны по сравнению с Румынией и Украиной по подиндексу «Человеческий и исследовательский капитал». По данному показателю потеряны 7 позиций, с 71-ой в 2014 году до 64-ой в 2019 году.

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**Ключевые слова:** инновации, инновационное развитие, устойчивость, глобальный индекс инноваций

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