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THE ROLE OF INNOVATIONS IN ECONOMIC DEVELOPMENT

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Introduction. It is no secret that ensuring sustainable economic growth is one of the top priorities of any country, and in modern times, innovations have a significant impact on the pace of economic growth. It is through the creation and implementation of new technologies that various issues facing society and the economy are solved.

The development trends of the global economy exacerbate competition between states, setting new preconditions for ensuring economic growth. Economic growth and development are determined by the implementation and impact of advanced scientific and technological achievements. The importance of innovation as the main driving force of economic progress and development is in the spotlight of governments, especially during the development of state policies. Most countries consider innovation to be an important and pivotal precondition for ensuring competitiveness and national progress[1].

Nowadays, in economic thought, great attention is paid to the fundamental patterns of development of the modern economy, which are characterized by changes in technological processes, as well as by economic growth and development conditioned by innovative transformations. In this context, the study of the pace of innovative development and competitiveness of countries is of great importance, which determines **the relevance of the research topic**.

In the modern world, innovations play a key role in increasing productivity, creating new markets, and improving the quality of life. **The purpose of this article** is to study and analyze the importance of the role of innovation in economic development, focusing on the Republic of Armenia.

The following objectives were set and solved to achieve the above-mentioned purpose:

- ✓ To study and analyze the GDP per capita in RA, which is a main indicator of economic growth.
- ✓ To study and analyze the volume of research and development (R&D) expenditures, which is a key indicator of innovative activity, and their share in GDP.
- ✓ To reveal the readiness of countries, particularly Armenia, for the Fourth Industrial Revolution through the index developed by the World Competitiveness Center.

Literature Review. The question of how technologies and innovations impact economic development has been a contentious issue for a long time. Even about half a century ago, there was an optimistic belief that poor economies could also have the

[1] J. Dempere, M. Qamar, H. Allam and Sabir Malik; The Impact of Innovation on Economic Growth, Foreign Direct Investment, and Self-Employment: A Global Perspective, 5 July 2023

potential to achieve technological and economic progress. The proponents of this view were neoclassical economists, who regarded technology as a so-called "public good" freely accessible to everyone, everywhere[1].

Undoubtedly, the academic literature examining the link between innovations and economic growth is quite extensive. Some researchers have focused on studying the positive interactions between economic progress and innovations at the company level. This group of researchers claims that the positive links found between a company's productivity and its exports are largely associated with the company's innovation decisions. In their studies, the authors assessed the impact of innovations on export productivity[2].

A wide range of researchers have also examined the positive interactions between economic growth and innovation at the national level. Numerous studies confirm the positive impact of innovation on economic growth. Theoretical models, such as the endogenous growth theory, emphasize that technological changes and innovation are the main drivers of sustained economic growth. Paul Romer's endogenous growth theory argues that long-term economic growth depends on the level of technological change, which can be positively influenced by investments in human capital and innovative research and development[3].

Authors Castellacci and Natera studied and analyzed the long-term development of Latin America from 1970 to 2010. Their focus was on economic openness, industrial structure, and innovations, and they determined how these three indicators affected the growth of per capita income[4].

Of course, not all authors have found positive links between innovations and economic growth; some have presented and demonstrated the detrimental effects of innovations through their studies. Nevertheless, in our research, we will examine this issue from a positive perspective, revealing the role of innovations in economic development.

Methodology. Scientific, historical-logical, as well as analytical-synthetic methods were used in the scope of the research. Using data from international and national sources, an analysis was carried out, revealing the degree of readiness of countries, in particular, Armenia, for innovative developments.

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[1] J. Fagerberg, M. Srholec and B. Verspagen; Innovation and Economic Development, Version of October 13, 2009

[2] B. Cassiman, E. Golovko, Ester Martínez-Ros; Innovation, exports and productivity, Volume 28, Issue 4, July 2010, Pages 372-376, https://www.sciencedirect.com/science/article/abs/pii/S0167718710000378?via%3Dihub

[3] Romer, Paul M. "Endogenous Technological Change." Journal of Political Economy, vol. 98, no. 5, Part 2, 1990, pp. S71-S102.

[4] F. Castellacci, J. M. Natera; Innovation, absorptive capacity and growth heterogeneity: Development paths in Latin America 1970–2010, Structural Change and Economic Dynamics, Volume 37, 2016, Pages 27-42

Analyses. Within the framework of scientific epistemology, the concept of technological and innovation-driven economic growth is examined through two types of technological advancement—extensive and intensive. It has been proven that among the factors of intensive growth, the most important role is played by scientific and technological progress, which is based on scientific discoveries and inventions, which in turn are the basis for innovations[1]. In the case of intensive type, economic growth is supported by the introduction and effective use of production and managerial innovations, facilitated by the adoption of new technologies. From this, we can conclude that economic growth depends on technological progress and the speed of implementing innovations, which are crucial factors for competitiveness at both the level of individual organizations and countries.

Empiric studies at the country level demonstrate that countries investing more in research and development (R&D) tend to have higher economic growth rates. For example, a study by the OECD in 2015 showed that a 1% increase in R&D expenditure leads to a 0.61% increase in GDP over the long term[2].

Research shows that in transition economies such as Armenia, investment in research and development (R&D) can contribute to economic growth.

In the table below, we present the GDP per capita and data on research and development (R&D) expenditures of the Republic of Armenia in recent years, illustrating the dynamics of investment in research and development.

Table 1

Data on GDP and R&D expenditures for 2015-2022[3]

Year	GDP per capita (at market prices, million AMD)	R&D expenditures (mln. USD)	Share of R&D expenditures in GDP
2015	5043633,2	37,5	0,25%
2016	5067293,5	36,2	0,23%
2017	5564493,3	38,0	0,24%
2018	6017035,2	39,8	0,25%
2019	6543321,8	43,5	0,27%
2020	6181902,6	46,3	0,28%
2021	6991777,8	50,0	0,30%
2022	8501449,4	53,8	0,32%

The analysis shows that research and development (R&D) expenditures have a positive impact on Armenia's economic growth. Gradually increasing investment in

[1] Е. В. Подшибякина, А В. Овчаров; Типы и факторы экономического роста, Том XXIII. 2009, № 11 (104), стр. 96-99

[2] Source: https://www.oecd.org/sti/frascati-manual-2015-9789264239012-en.htm

[3] Data is obtained from publications of the RA Statistical Committee, the World Bank, and the OECD.

research and development has a positive effect, contributing to the growth of GDP per capita.

Engaging in international competition, it is necessary to note that it is evaluated by the World Economic Center, while the basis of this assessment is the potential force of economic growth of the population. The table compiled by the headquarters presents data from 64 countries, chosen for their presence in international information resources and local cooperative institutions, ensuring complete and actual accuracy, correctness, and authenticity. The international competition rating is calculated based on 336 indicators classified into four main groups and represents the result of comprehensive temporary economic literature, international, national, and regional sources, as well as reports obtained from public structures and scientists.

The indicators are revised regularly as the global economy develops. The above 4 main subgroups are:

- Economic indicators,
- government efficiency,
- business efficiency,
- the infrastructures[1].

The ranking is based on the World Competitiveness Center's belief that the competitiveness and economic growth of countries cannot be determined solely by GDP, as countries face and must overcome a number of other political and socio-economic challenges. Perhaps these challenges and a rapidly changing world have led to the calculation of the following indices along with the global competitiveness index:

- Digital competitiveness index, consisting of 54 indicators characterizing knowledge, technology, and readiness for the future;
- talent attraction index, consisting of factors characterizing investment and development, attractiveness, and readiness[2].

The Table 2 contains data of the state of the above mentioned indices in several countries in 2019-2023. The evaluation was carried out by collecting and recording the standards included in all subgroups, and based on the resulting indicators, the general evaluation was formed.

[1] World Competitiveness center; World Competitiveness Ranking, https://www.imd.org/centers/wcc/world-competitiveness-center/rankings/world-competitiveness-ranking/

[2] World Competitiveness Center; https://worldcompetitiveness.imd.org/rankings/talent

Table 2

The positions of the countries in terms of indices in 2019-2023[1]

Year	Position	Global Competitiveness Index	Digital Competitiveness Index	Talent attraction Index
2019	1/64	Singapore	USA	Switzerland
2020	1/64	Singapore	USA	Switzerland
2021	1/64	Switzerland	USA	Switzerland
2022	1/64	Denmark	Denmark	Switzerland
2023	1/64	Denmark	USA	Switzerland

Denmark, which ranks first in the global competitiveness index in 2023, has significantly improved its position in recent years, rising from 8th place in 2019 to 2nd place in 2020. Armenia has also registered a similar upward trend, having risen from 11th place in the 2022 Horizon Index to 2nd place in 2023. Over the past 5 years, Taiwan and China have also improved their positions by 10 positions. The United States ranked first in the digital competitiveness ranking since 2019 and only took 2nd position in 2022. In recent years, Sweden and Hong Kong have seen regression. Since 2019, Switzerland has been the absolute leader in the talent attraction rankings. Belgium made sharp progress, finishing in 4th place from 13th in 2022. And here, after 2nd position in 2022, Sweden weakened its position, taking the 10th position[2].

It should be emphasized that the results recorded by the countries in recent years were influenced by the negative consequences of the COVID-19 pandemic, as well as by the recovery measures and changes in priorities applied by the countries, upon which all attention and potential were focused.

Unfortunately, Armenia is missing not only from the list of countries presented in the table, but also since 2019 it has not been included in the list of 64 countries for which assessments are carried out. According to the results calculated in 2019, Armenia improved its position by one position compared to the previous year, occupying the 69th position among 141 countries. Furthermore, the improvement in RA positions primarily occurred due to the enhancement of sub-indices in information technology, financial markets, institutions, and infrastructure[3].

It can be noted that participation in country competitiveness assessments significantly depends on innovations, technologies, and digitalization, their creation, and integration involving human capital's role and significance in economic performance and sustainability. These are the activities without which effective economic activity and ecological growth are impossible today.

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[1] Data: World Competitiveness Center; https://worldcompetitiveness.imd.org/rankings/wcy

[2] World Competitiveness Center; https://worldcompetitiveness.imd.org/rankings/wcy

[3] Luys Foundation; The study of indicators and indices published by international organizations; 2019

Since the beginning of the 2000s, the influence of innovations on the socio-economic development and progress of countries has been the focus of the World Intellectual Property Organization, WIPO. Against the backdrop of economic and geopolitical changes, already in 2007, the World Intellectual Property Organization began to calculate the Global Innovation Index (GII), the purpose of which was to identify and classify the most innovative countries in the world, highlight the advantages and disadvantages of innovation, and also share the obtained results with all countries, then providing Councils of strategic importance related to the sector[1].

Research and evaluation are conducted in 132 countries, employing a methodology that encompasses over 80 indicators, each grouped into 8 categories, which are further subdivided into 7 main groups, describing innovations and their resulting conclusions. The 7 primary groups are as follows:

- Institutions,
- Human capital and research,
- Infrastructure,
- Market sophistication,
- Business sophistication,
- Knowledge and technology outputs,
- Creative outputs.

Yes, the world is experiencing rapid development in two parallel realities, where, on the one hand, breakthrough technological progress is being recorded, and on the other, high inflation and long-term negative consequences of the epidemic are hindering the development of innovation. Now let's present the results and positions of the countries of the World Innovation Index in 2023, for the top ten and for Armenia, using the table.

Table 3

Global Innovation Index in 2023[2]

GII Rank	Country	Score	Income group rank
1	Switzerland	**67,6**	In the high-income group: 1
2	Sweden	**64,2**	In the high-income group: 2
3	USA	**63,5**	In the high-income group: 3
4	The United Kingdom	**62,4**	In the high-income group: 4
5	Singapore	**61,5**	In the high-income group: 5
6	Finland	**61,2**	In the high-income group: 6
7	Netherlands	**60,4**	In the high-income group: 7
8	Germany	**58.8**	In the high-income group: 8

[1] Global Innovation Index; https://www.globalinnovationindex.org/Home

[2] Data: Global Innovation Index; https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023-en-main-report-global-innovation-index-2023-16th-edition.pdf

GII Rank	Country	Score	Income group rank
9	Denmark	**58.7**	In the high-income group: 9
10	Republic of Korea	**58.6**	In the high-income group: 10
72	Republic of Armenia	**28.0**	In the upper-middle-income group: 17

It can be seen from the table that countries with a high level of income occupy the top positions of the rating table. Fortunately, in contrast to the rating evaluation of competitiveness, it was possible to calculate the Global Innovation Index for RA as well. Armenia is classified as an upper-middle-income country and improved its position during 2023, rising from 80th position in 2022 to 72nd. Among neighboring countries, Armenia is losing its position to Turkey, Iran, Georgia, and the Russian Federation and has overtaken Azerbaijan. Now let's present the results recorded by Armenia in terms of its position in each group of indicators using a table.

Table 4

RA's position in the groups of indicators included in the calculation of the Global Innovation Index, 2023[1]

Group of indicators	Ranking position
Institutions	**69**
Human capital and research	**92**
Infrastructure	**79**
Market sophistication	**89**
Business sophistication	**94**
Knowledge and technology outputs	**67**
Creative outputs	**61**

In all of the above groups, the results recorded by the RA are in the third quarter, that is, in positions 66-99. The only exception is the Creative Outputs group, for which the RA is at stage 2, that is, between 34th and 66th positions. Compared to 2022, Armenia has regressed in 4 groups: Institutions, Human capital and research, Market sophistication, and Business sophistication[2].

Summarizing the results allows us to ascertain the presence of a relationship between innovation and socio-economic development among countries, which is evident amid the global and national economic growth trends. Developed high-income countries have taken leading positions in both competitiveness rankings and global innovation indices. Unfortunately, the lack of and incomparability of data did not allow for a more complete study and analysis of RA. This is perhaps a serious problem from the point of view of the inability to correctly assess the progress taking place in the

[1] Data: Global Innovation Index; https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023-en-main-report-global-innovation-index-2023-16th-edition.pdf

[2] Data: Global Innovation Index; https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023-en-main-report-global-innovation-index-2023-16th-edition.pdf

world in comparison and not to determine new development goals. Incomplete and incomparable digital data makes it impossible to correctly assess the situation, and understand gaps in the industry and the reasons for failures.

Scientific novelty. As a result of research and analysis, the existing connection between innovation and economic growth and the need to conduct industry-wide comprehensive research has been established.

Conclusions. Powerful technological progress and the use of innovative technologies in various spheres of public life continue to create new prospects and opportunities for the development of countries.

From the indicators used as the basis for calculating all the coefficients presented during the study, we can conclude that innovation is, on the one hand, the material and intangible result of the innovation process, and on the other, the process of implementing something new. An idea in any field of human activity that helps satisfy the needs and weaknesses of the market allows for economic benefits. In most developed countries, innovation is identified as a priority sector that ensures economic development. However, the level of innovative development of the Republic of Armenia lags significantly behind the countries that have registered targets, and desired indicators. In other words, the existing tools for realizing the country's innovative potential are ineffective.

To emerge from the created situation, it is necessary to:

- Increased investment in research and development: Armenia's government must continue to increase funding for research and development to stimulate the growth of new initiatives.
- Support for innovative sectors: The development of such sectors, like information technologies, which can significantly contribute to economic growth.
- Updating statistics related to target industries and creating new information bases, using the experience and methodology of countries of leading positions in the global competitiveness index, as well as in the global innovation index.

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10. OECD; https://www.oecd.org/sti/frascati-manual-2015-9789264239012-en.htm
11. RA Statistical Committee, https://armstat.am/am/?nid=12&id=01001&submit=%D5%93%D5%B6%D5%BF%D6%80%D5%A5%D5%AC
12. World Bank, https://www.worldbank.org/en/home

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Տաթևիկ Վազգենի Շահինյան

Համառոտագիր. Գաղտնիք չէ, որ ցանկացած երկրի առաջնահերթություններից է կայուն տնտեսական աճի ապահովումը, իսկ արդի ժամանակներում տնտեսական աճի տեմպերի վրա իրենց մեծ ազդեցությունն են ունենում նորարարությունները: Նոր տեխնոլոգիաների ստեղծման ու ներդրման միջոցով են լուծվում հասարակության ու տնտեսության առջև ծառացած տարաբնույթ խնդիրներ:

Հատկապես արդիական է երկրների նորարարական զարգացման տեմպերի և մրցունակության հարցերի ուսումնասիրությունը:

Հոդվածի նպատակն է ուսումնասիրել ու վերլուծել նորարարության դերի կարևորությունը տնտեսության զարգացման գործում՝ ուշադրությունը կենտրոնացնելով Հայաստանի Հանրապետության վրա:

Հետազոտության ընթացքում խնդիր է դրվել ուսումնասիրել ու վերլուծել մեկ շնչին բաժին ընկնող ՀՆԱ-ն, դրանում հետազոտությունների և զարգացման (R&D) ծախսերի մասնաբաժինը՝ ՀՀ համար, ինչպես նաև միջազգային ինդեքսների միջոցով բացահայտել երկրների պատրաստվածությունը չորրորդ արդյունաբերական հեղափոխությանը:

Սույն հետազոտության շրջանակում օգտագործվել են գիտական՝ պատմական-տրամաբանական, ինչպես նաև վերլուծական-սինթետիկ մեթոդները: Օգտագործելով միջազգային և ազգային աղբյուրների տվյալներն իրականացվել է վերլուծություն՝ բացահայտելով երկրների, մասնավորապես, Հայաստանի պատրաստվածության աստիճանը նորարարական զարգացումներին:

Ուսումնասիրությունների ու վերլուծությունների արդյունքում առաջարկվում է հետազոտությունների և զարգացման ոլորտում ներդրումների ավելացում, նորարարական ոլորտների աջակցություն, ինչպես նաև թիրախային ոլորտներին առնչվող վիճակագրական տվյալների թարմացում ու նոր տեղեկատվական բազաների ձևավորում:

Վերլուծությունների արդյունքում **ստացվել է հետևյալ գիտական նորույթը.** Ուսումնասիրությունների ու վերլուծությունների արդյունքում հիմնավորվել է նորարարությունների ու տնտեսության զարգացման միջև առկա կապը, ինչպես նաև ոլորտային, համապարփակ հետազոտությունների իրականացման անհրաժեշտությունը:

Վերլուծությունների արդյունքում ստացված արդյունքները կարող են օգտակար լինել ոլորտի պատասխանատուներին, ոլորտով հետաքրքրված հետազոտողներին ու քաղաքացիական հասարակությանը՝ օգնելով նպատակային ու արդյունավետ կերպով կենտրոնացնել ու իրացնել երկրի ներուժը:

Բանալի բառեր. նորարարություններ, տնտեսության զարգացում, մեկ շնչին բաժին ընկնող ՀՆԱ, հետազոտությունների և զարգացման (R&D) ծախսեր, նորարարական տեխնոլոգիաներ, համաշխարհային մրցունակություն, մարդկային կապիտալ, ենթակառուցվածքներ, գործարարություն, տնտեսական ցուցանիշներ, նորարարությունների համաշխարհային ինդեքս:

РОЛЬ ИННОВАЦИЙ В РАЗВИТИИ ЭКОНОМИКИ

Татевик Вазгеновна Шагинян

Аннотация. Не секрет, что обеспечение стабильного экономического роста является одним из приоритетов любой страны, и в наше время инновации оказывают большое влияние на темпы экономического роста. Посредством создания и внедрения новых технологий решаются различные проблемы, стоящие перед обществом и экономикой.

Особенно **актуально** изучение темпов инновационного развития и конкурентоспособности стран.

Цель статьи – выявить тенденции мирового инновационного развития, а также степень конкурентоспособности стран. Подчеркнуть социально-экономическую значимость инноваций, пробелы в соответствующей сфере РА и предложить пути улучшения.

В ходе исследования **была поставлена задача** изучить и выявить тенденции мирового инновационного развития, проанализировать ключевые показатели и зафиксированные РА результаты, обосновывая значимость инноваций в экономическом росте и развитии стран.

Используя научные, историко-логические, а также аналитико-синтетические **методы,** индексы и рейтинги, рассчитанные Всемирным центром конкурентоспо-

собности и Всемирной организацией интеллектуальной собственности, были выявлены основные факторы обеспечения экономического роста и уровня инновационного развития стран.

В результате исследований и анализов рекомендуется радикально обновить статистические данные, относящиеся к целевым отраслям, и сформировать новые информационные базы, используя опыт и методологию стран, занимающих лидирующие позиции в мировом рейтинге конкурентоспособности, а также в глобальном инновационном индексе.

В результате анализа была получена следующая **научная новизна:** в результате исследований и анализов установлена существующая связь инноваций с экономическим ростом и необходимость проведения отраслевых комплексных исследований.

Полученные результаты анализа, могут быть полезны руководителям отрасли, исследователям, заинтересованным в отрасли, и гражданскому обществу, помогая целенаправленно и эффективно реализовать потенциал страны.

Ключевые слова: Инновации, экономический рост, инновационные технологии, глобальная конкурентоспособность, человеческий капитал, инфраструктура, бизнес, экономические показатели, глобальный инновационный индекс.

THE ROLE OF INNOVATIONS IN ECONOMIC DEVELOPMENT

Tatevik Vazgen Shahinyan

Abstract: It is no secret that ensuring stable economic growth is one of the priorities of any country, and nowadays, innovation has a great impact on economic growth rates. Various problems that haunt society and the economy are solved through the creation and implementation of new technologies. The study of the pace of innovative development and competitiveness of countries is especially **relevant**.

The purpose of the paper is to identify trends in global innovative development, as well as the degree of competitiveness of countries emphasize the socio-economic significance of innovation, gaps in the relevant area of RA, and suggest ways for improvement.

The objective of the research was to study and identify trends in global innovative development and analyze key indicators and results recorded by the RA, justifying the importance of innovation in the economic growth and development of countries.

Using historical-logical and analytical-synthetic scientific methods, indices, and ratings, calculated by the World Competitiveness Center and the World Intellectual Property Organization, the determinants ensuring economic growth and the level of innovative development of countries were identified.

Research findings bring to the conclusion that **it is recommended** to radically update statistical data related to target industries and create new databases, using the

experience and methodology of countries occupying leading positions in the world competitiveness ranking, as well as in the global innovation index.

The following scientific novelty was obtained: as a result of research and analysis, the existing connection between innovation and economic growth and the need to conduct industry-wide comprehensive research has been established.

The research findings can be useful to industry representatives, researchers interested in the industry, and to the wider society, helping to purposefully and effectively realize the country's potential.

Keywords: Innovation, economic growth, innovative technologies, global competitiveness, human capital, infrastructure, business, economic indicators, global innovation index.