ARMENIA'S INNOVATION JOURNEY IN 2024:
ANALYZING KEY SHIFTS AND CHALLENGES

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The paper examines Armenia's performance in the Global Innovation Index (GII) 2024, focusing on the indicators describing innovation input and output. The analysis reveals both progress and challenges in various areas of Armenia's innovation ecosystem. The country improved its ranking compared to the previous three years, with notable advancements in scientific publications, which increased by 9%, and strong performance in ICT services exports (ranking 8th globally) and Trademarks by origin (7th globally). However, persistent issues include low public spending on education and science, a small number of researchers per million inhabitants, and weak university-industry collaboration.

An analysis of innovation inputs and outputs in different countries can be conducted by examining the Global Innovation Index (GII) published by the World Intellectual Property Organization (WIPO). The GII was first developed in 2007 and, since 2013, has been published annually. Each year, it includes a broader set of indicators, now comprising a total of 78 indicators grouped under two pillars: Innovation Input and Innovation Output. Together, these pillars reflect a country's innovation capacities and performance, which form the basis for ranking the countries.

While the Innovation Input pillar consists of five sub-pillars and the Innovation Output sub-pillar contains two pillars, both sub-pillars have equal weight in the calculation of the overall index. The 2024 report includes 133 countries, representing approximately 93% of the world's population

TABLE 1

Armenia GII Ranking, 2020-2024

Year	GII Position	Innovation Input	Innovation output
2020	61	83	47
2021	69	85	56
2022	80	82	73
2023	72	83	62
2024	63	79	55

and 98% of global GDP[1].

In 2024, Armenia improved its ranking compared to the previous three years. However, it remains two positions behind its 2020 rank and four positions behind its rankings in 2013 and 2017, which were Armenia's best performances to date. Armenia has improved its position in both innovation outputs and inputs, with the country achieving its best result in the Innovation Input sub-index in 2024 over the past five years.

In 2024, Armenia experienced both progress and setbacks in several GII indicators. Notably, Armenia improved its ranking in the number of scientific publications, a metric characterizing Innovation Output, with an approximately 9% increase[2] compared to the previous year. While the GII calculations are based on publications indexed in the Web of Science, due to the lack of publicly accessible analytical tools for that system, it is not possible to specify the exact number of articles published by Armenia. However, in Scopus, a comparable database, Armenia had 1,652 publications in 2023 (as of November 2024).

As illustrated in Figure 1, most of these articles were published in Physics and Astronomy, followed by Medicine and Engineering. Overall, only 146 articles were published in Social Sciences, a broad category encompassing topics ranging from anthropology to education, law, and transportation. The fields with the fewest publications were Economics, Econometrics, and Finance (27 articles) and Business, Management, and Accounting (20 articles).

It is important to note that the multiple classification system employed in Scopus, which allows articles to be categorized under several fields, results in a higher total number of entries when analyzing data by subject area. Specifically, some articles may simultaneously fall under multiple subject areas, such as Computer Science and Medicine, meaning the same article is counted in two or more fields. Consequently, the sum of the subject area counts exceeds the total number of Armenia's publications for 2023, which stands at 1,652. This multiple classification is crucial to consider when interpreting data across disciplines.

Additionally, some economics-related articles might be classified under other subject areas, such as Social Sciences or Business, Management, and Accounting, potentially causing slight deviations in the numbers. However, these figures align closely with global trends, where the majority of scientific publications are concentrated in the fields of Medicine and Natural Sciences. For instance, in 2023, approximately 28% of articles indexed in Scopus globally were related to Medicine, 11% to Physics and Astronomy, 8% to Chemistry, 7% to Mathematics, and only 2% to Economics, Econometrics, and Finance. Similarly, the share of publications in Business, Management, and Accounting was around 3%. Thus, Armenia's indicators align well with the logic of global trends.

In 2024, Armenia recorded a setback in its public expenditure on education as a percentage of GDP, which stood at 2.5%,

1   Global Innovation Index 2024: Unlocking the Promise of Social Entrepreneurship, 2024 Report https://www.wipo.int/web-publications/global-innovation-index-2024/assets/67729/2000%20Global%20Innovation%20Index%202024_WEB3lite.pdf
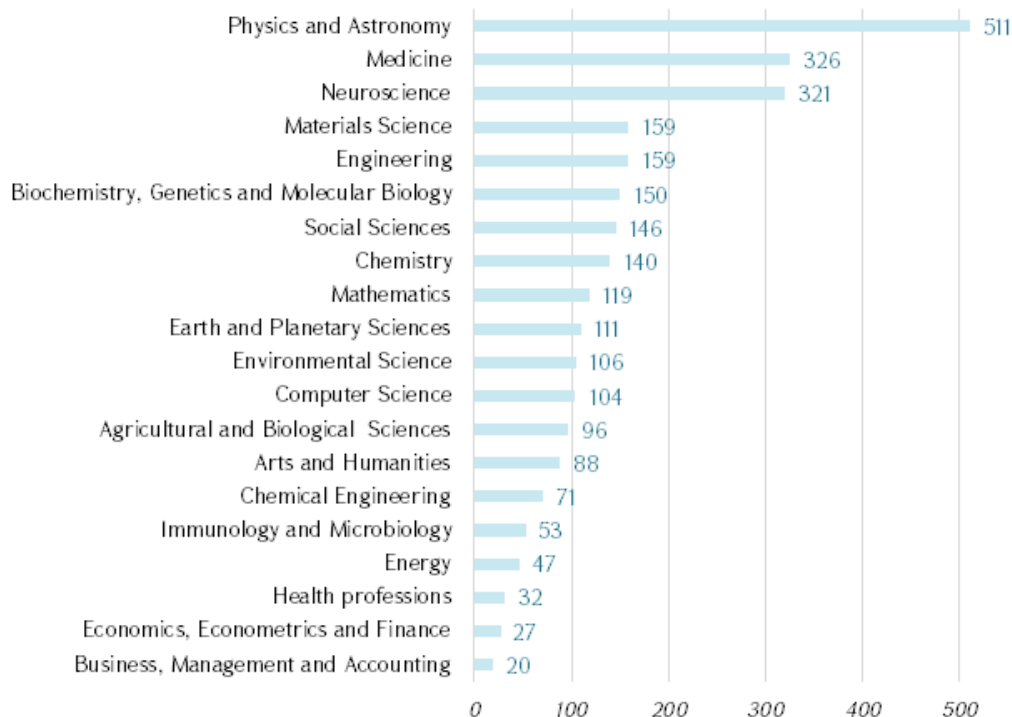2   WIPO, GII Country Profile, https://www.wipo.int/gii-ranking/en/armenia

FIGURE 1

Distribution of Armenia's Scientific Publications in Scopus-indexed Journals by Subject Area in 2023[3]

placing the country in the 114th position in this indicator. On the other hand, the Tertiary Inbound Mobility indicator, at 7.3%, showed improvement compared to the previous year. This metric reflects the number of students from abroad studying in a given country as a percentage of the total tertiary-level enrollment in that country.

Regarding the Human Capital and Research sub-pillar, which characterizes innovation inputs, Armenia's public expenditure on research as a percentage of GDP remained unchanged at 0.2% compared to the previous year. Comparisons reveal that Armenia lags significantly behind the global average in terms of public spending on both education and research, highlighting a critical area for improvement[4].

An important indicator reflecting the resources of innovation activity is the number of researchers per million inhabitants, which is calculated for several countries, including Armenia, by UNESCO. This calculation is based on the Full-time Equivalent (FTE) principle. As illustrated in Figure 2, Armenia ranks below all countries in the Eurasian Economic Union (EAEU) and the region, except for Kazakhstan (data for Kyrgyzstan is unavailable). The number of researchers per million inhabitants is directly linked to the number of scientific publications. Therefore, to increase the volume of publications, it is essential to also expand the number of researchers.

In contrast to the previously mentioned indicators, Armenia performs relatively well in terms of outstanding loans from microfinance institutions as a percentage of GDP, with a 3% rate, ranking 13th out of 133 countries. However, the indicator reflecting the diversification of the domestic market remains low.

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3   Scimago Journal & Country Rank platform, https://www.scimagojr.com/countrysearch.php?country=AM
4   Tadevosyan, R. (2023). A Comprehensive Analysis of Armenia's Innovation Input and Output. Messenger of ASUE, 3(75), 83-99. DOI: 10.52174/1829-0280_2023.3-83
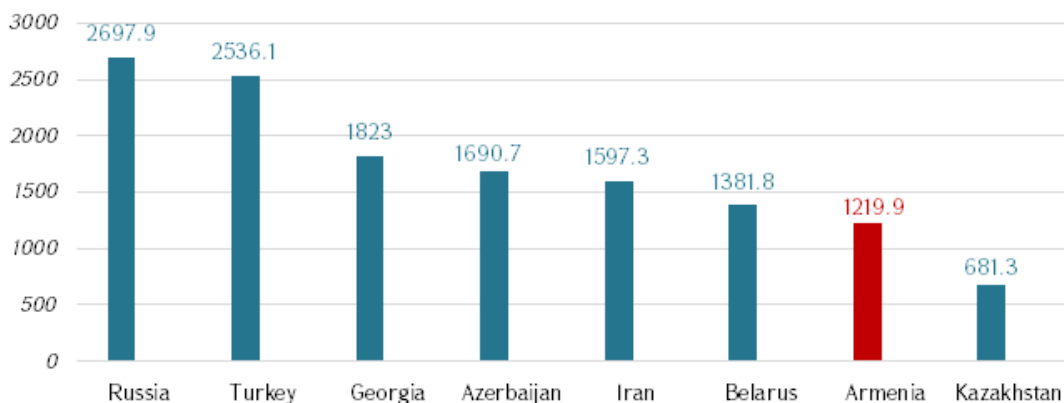
FIGURE 2

Number of Researchers per Million Inhabitants, 2022[5]

Challenges also persist in innovation linkages, particularly in university-industry R&D collaboration, as well as in the level of cluster development. On the other hand, Armenia shows strong performance in high-tech imports and exports as a share of total trade.

Nevertheless, Armenia falls behind most countries included in the rankings in terms of High-technology and medium-high technology (MHT) output as a percentage of total manufacturing output, with a 4.8% rate, ranking 98th globally.

Armenia is steadily strengthening its position in ICT services exports, with a 7.2% share of total trade, ranking 8th this year. Another important indicator of Innovation Output, Trademarks by origin as a percentage of GDP (PPP-adjusted), places Armenia 7th globally. In terms of creative goods exports as a percentage of total trade, Armenia ranks 16th with a 3.2% share.

Armenia also demonstrates strong performance in two other Innovation Output indicators: GitHub commits per million inhabitants aged 15–69 and Mobile app creation as a percentage of GDP (PPP-adjusted), ranking 36th in both.

Thus, the study highlights that although Armenia has shown improvement in both innovations input and output indicators this year, its best results remain concentrated in output-related indicators. Persistent challenges for Armenia include: low levels of public spending on education as a percentage of GDP, low public spending on science, and a small number of researchers per million inhabitants compared to regional and EAEU countries. At the same time, Armenia continues to achieve impressive results in ICT services exports and Trademarks by origin, demonstrating potential for further strengthening its innovation system.

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[5]   UNESCO, https://data.uis.unesco.org/

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Ռուզաննա ԹԱԴԵՎՈՍՅԱՆ
*«Ամբերդ» հետազոտական կենտրոնի ավագ հետազոտող, ՀՊՏՀ,
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ԿՐԹՈՒԹՅՈՒՆ, ՆՈՐԱՐԱՐՈՒԹՅՈՒՆ, ԳԻՏԵԼԻՔ

ՀԱՅԱՍՏԱՆԻ ԻՆՈՎԱՑԻՈՆ ՈՒՂԻՆ 2024 Թ.-ԻՆ. ՀԻՄՆԱԿԱՆ ՓՈՓՈԽՈՒԹՅՈՒՆՆԵՐԻ ԵՎ ՄԱՐՏԱՀՐԱՎԵՐՆԵՐԻ ՎԵՐԼՈՒԾՈՒԹՅՈՒՆ

Հոդվածում վերլուծվել է Հայաստանի դիրքը 2024 թ.-ի Գլոբալ ինովացիոն ինդեքսում (ԳԻԻ)՝ ուշադրություն դարձնելով նորարարական ռեսուրսները և արդյունքները բնութագրող ցուցանիշներին: Հայաստանը գրանցել է ինչպես առաջընթաց, այնպես էլ հետընթաց ինովացիոն էկոհամակարգի տարբեր ոլորտներում: Երկիրը բարելավել է իր դիրքերը նախորդ երեք տարիների համեմատ, մասնավորապես՝ գիտական հրապարակումների թվի 9%-անոց աճով, ինչպես նաև ՏՀՏ ծառայությունների արտահանման (աշխարհում 8-րդ տեղ) և Առևտրային նշանների գրանցման (7-րդ տեղ) ցուցանիշներով: Այնուամենայնիվ, շարունակում են մտահոգիչ մնալ կրթության և գիտության պետական ծախսերի ցածր մակարդակը, մեկ միլիոն բնակչի հաշվով հետազոտողների փոքր թիվը և համալսարան-արդյունաբերություն համագործակցության թույլությունը:

Հիմնաբառեր. *ինովացիա, ցուցանիշ, արդյունք, ներդրանք, հրապարակում*

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ОБРАЗОВАНИЕ, ИННОВАЦИИ, ЗНАНИЯ

ИИННОВАЦИОННЫЙ ПУТЬ АРМЕНИИ В 2024 ГОДУ: АНАЛИЗ КЛЮЧЕВЫХ ИЗМЕНЕНИЙ И ВЫЗОВОВ

В статье анализируется положение Армении в Глобальном инновационном индексе (GII) 2024 года с акцентом на индикаторы инновационных ресурсов и результатов. Анализ показывает как прогресс, так и трудности в различных аспектах инновационной экосистемы Армении. Страна улучшила свои позиции по сравнению с предыдущими тремя годами, продемонстрировав значительный рост научных публикаций (на 9%), а также высокие показатели по экспорту ИКТ-услуг (8-е место в мире) и по количеству торговых марок (7-е место). Однако сохраняются проблемы, такие как низкий уровень государственных расходов на образование и науку, малое количество исследователей на миллион жителей и слабое сотрудничество между университетами и промышленностью.

Ключевые слова: *инновация, индикатор, ресурсы, результаты, публикация*