

INNOVATION PERFORMANCE IN ROMANIA

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ABSTRACT: *Innovation has become the modern society symbol, a solution for solving many problems and a phenomenon that must be studied. Although it has always existed, innovation gained real importance in the 20th century. To some extent, every person is innovative: the artists are innovative, the scientists are innovative, and so are organizations.*

Research and innovation provide us with the knowledge and solutions needed for urgent issues, such as socio-economic crises, but also for long-term societal challenges. In everyday life, research and innovation bring improvements in various socio-economic fields and is the launching pad for many new products and services.

Although Romania is a modest innovator, the export of high-tech products and the penetration of broadband Internet services are the only two indicators in the European Innovation Scoreboard that show our country's innovation performance. For this reason we consider that it important to analyse in this paper the place that Romania occupies in the European Union through the lens of the two indicators mentioned above, as well as the position of our country compared to the group of leading innovative countries, but also to the group of emerging innovative countries, group of which Romania is a part.

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1. INTRODUCTION

Innovation has become the modern society symbol, a solution for solving many problems and a phenomenon that must be studied. Although it always existed, innovation gained real importance in the 20th century. To some extent, every individual is innovative: artists are innovative, scientists are innovative, and so are organizations.

In the current approach, innovation is a process by which a domain, product or service is renewed and updated by applying new processes, introducing new techniques or establishing successful ideas to create a new value. Innovation is not just the introduction or implementation of new ideas or methods, but it can be defined as a process involving multiple activities to discover new ways of doing things.

In the present, we are positioned in a fast-paced environment where technology is advancing and globalization is developing. This means that the market competition is increasing and customer expectations are higher. For a business or organization to gain competitive advantages, it must be able to adapt and innovate according to changing trends and new generations.

Innovation creates great opportunities and is essential to a company's survival, economic growth and success. Innovation helps develop original concepts and is an engine for optimizing operations. Companies that innovate are able to place the organization in a different paradigm to identify both opportunities and the best ways to solve current problems, actions needed to create new ideas, processes or products that, when implemented, lead to positive and effective changes. [1]

Research and innovation provide us with the knowledge and solutions needed for urgent problems, such as socio-economic crises, but also for long-term societal challenges. In everyday life, they bring improvements in various socio-economic fields and are the launching pad for many new products and services. That is why we consider it necessary to analyse the factors that favour innovation in our country.

2. FAVOURABLE FACTORS OF INNOVATION IN ROMANIA

In terms of the innovation system performance Romania ranks last in the European Union, belonging to the group of emerging innovative countries. Our country registers the lowest values, being at a considerable distance even from the countries in its group (emerging innovators). However, the export of high-tech products and the penetration of broadband Internet services are, in our opinion, indicators that show our country's innovation performance.

In this context, we consider it important to analyse the place that Romania occupies in the European Union through the prism of the two indicators mentioned above, as well as the position of our country compared to the group of leading innovative countries, but also to the group of emerging innovative countries. According to the innovation systems performance of the European Union Member States, the group of leading innovative countries (with the performance of innovation systems well above the EU average) consists of Belgium, Denmark, Finland and Sweden, and the group of emerging innovative countries (with the performance of innovation systems well below the EU average) is made up of Romania, Bulgaria, Latvia, Poland, Slovakia, Hungary and Croatia.

Export of high-tech products

"High technology" is a term generally applied to economic and industrial sectors where technological innovation is emphasized. High-tech industries play an important role in the modern economy. [8] The creation of new technologies, their efficient use and their

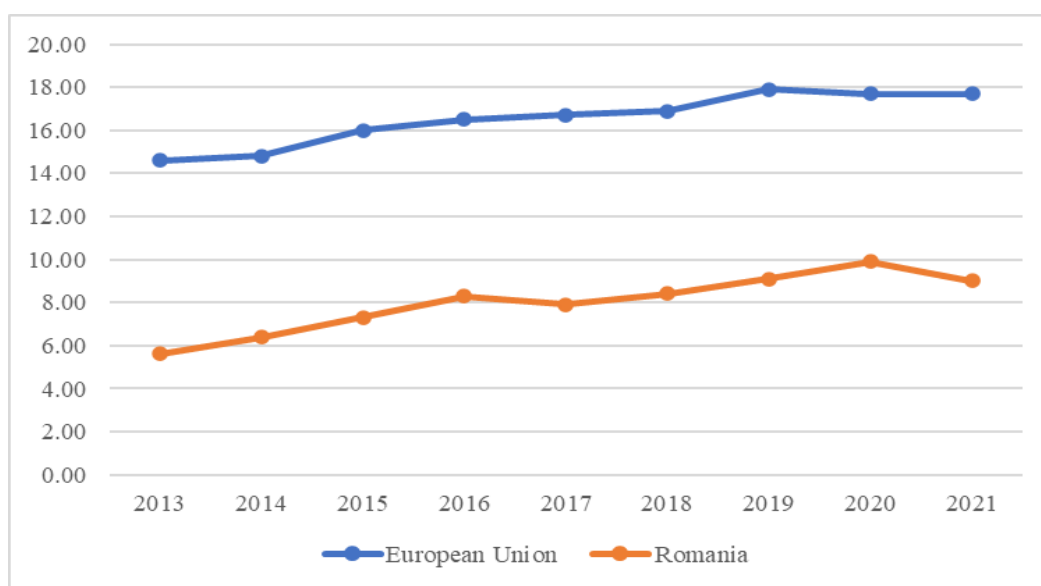
introduction to the market are essential in the global race for competitiveness. High-tech sectors and enterprises are key drivers of economic growth and productivity and generally provide high-value-added jobs. [4]

The indicator "export of high-tech products" shows the share of exports of all high-tech products in total exports. The high-tech products included in this indicator are defined as the sum of products from the fields of: aerospace, computers-office machines, electronics-telecommunications, pharmacy, scientific instruments, electric machines, chemistry, non-electric machines and armaments. A first analysis of this indicator aims at the positioning of Romania in relation to the average of the European Union.

As it can be seen, in the last 9 years Romania had, in general, an increasing evolution in terms of exports of high-tech products, being in most of the analysed period at half of the European Union average. Regarding the trend in the European Union, it is also predominantly increasing in the analysed period, the highest value being reached in 2019.

The increasing evolution of the high-tech products exports can be explained by the increase in the complexity of the exported products and the advanced technologies underlying them, as well as by the evolution of global demand and supply, which influences the prices of these products. These trends highlight, at the same time, the increase in the degree of adaptation of Romanian export products to the conjuncture of foreign markets.

Figure 1. Exports of high-tech products Romania – EU



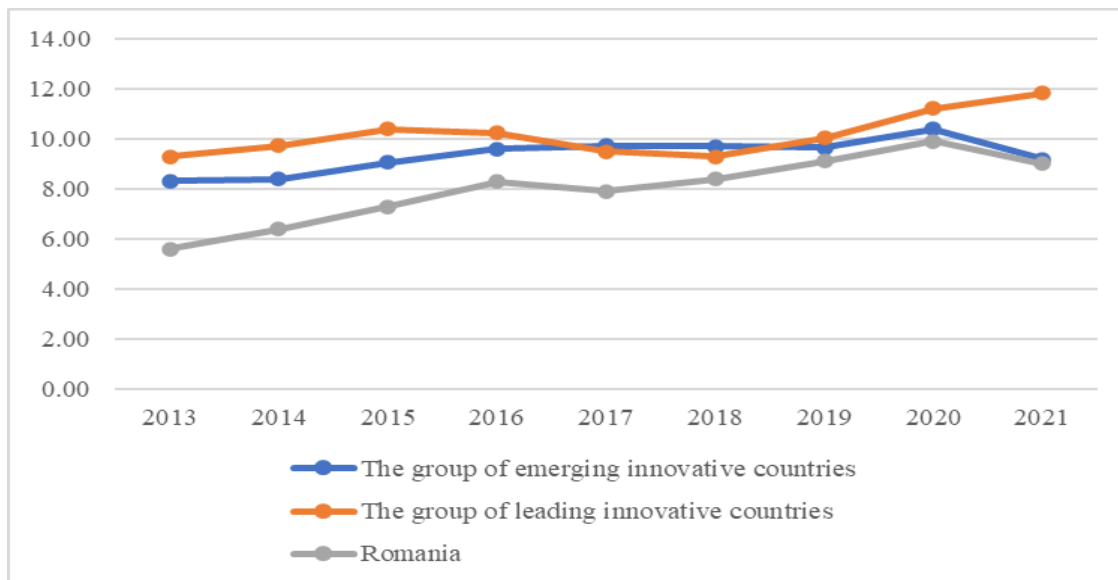
Source: <https://ec.europa.eu/eurostat/data/database>

It is also worth mentioning that Romania is an important regional centre for software developers, several cities in this country being associated with the IT sector. Among them is not only Bucharest, but also Cluj, being often referred to as the "Silicon Valley of Europe", Timișoara, Iași or Brașov. Statistics show that Romania has a higher number of software developers per capita than in the United States of America, China or Russia. IT specialists from Romania are particularly renowned for software development, web pages or fintech. From the point of view of employees in the IT sector, Romania presents a high level, having almost 200,000 specialists and being close to the level of the Czech Republic. [2]

Regarding Romania's position in relation to the two groups of analyzed countries (leading innovators and emerging innovators) we can appreciate that the differences between the exports of high-tech products of our country and the exports of high-tech products of the

other countries (expressed as a percentage of total exports) have softened considerably in the last 9 years.

Figure 2. Exports of high-tech products Romania – group of emerging innovative countries – group of leading innovative countries



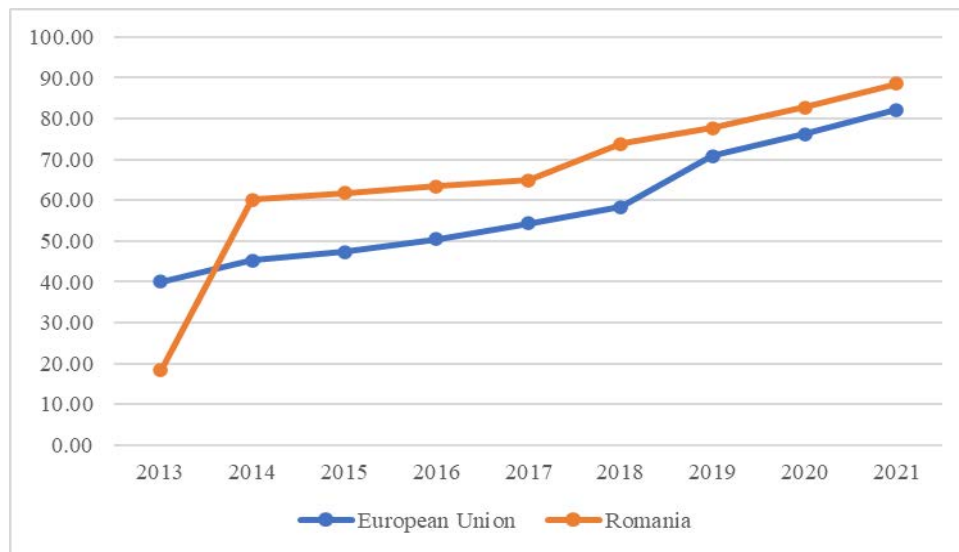
Source: author own processing, <https://ec.europa.eu/eurostat/data/database>

Thus, in 2021 the difference between Romania and the group of leading innovative countries was 2.83% compared to 3.70% in 2013, and last year the difference between Romania and the group of emerging innovative countries was only 0.20% compared to 2.71% in 2013. Therefore, we can say that our country has constantly improved the level of the share of high-tech product exports in Romania's total exports (from 5.60% in 2013 to 9.00% in 2021), thus aligning with the average of the group of countries to which it belongs.

Penetration of broadband internet services

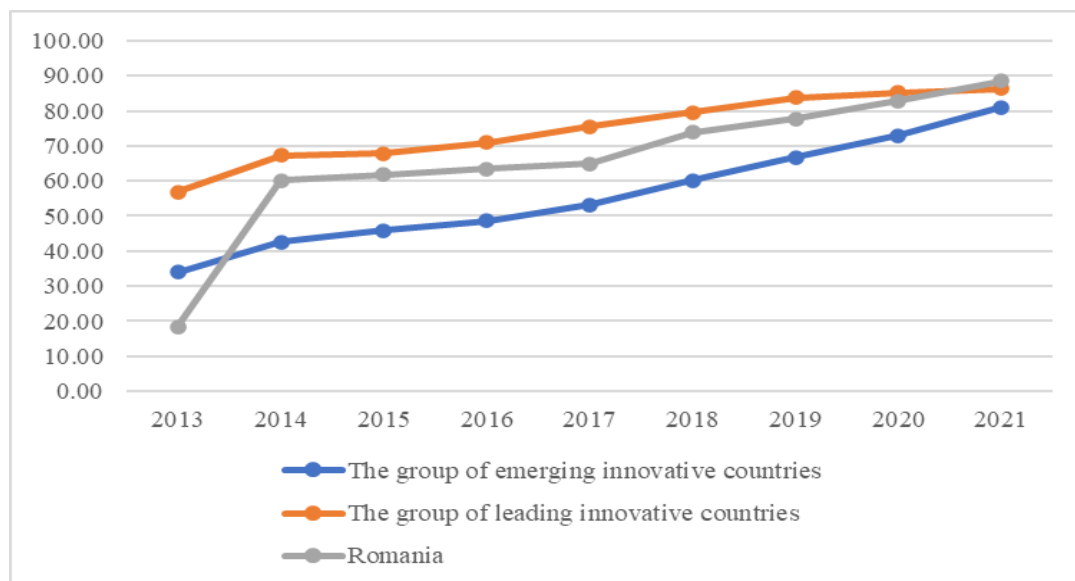
Broadband Internet refers to high-speed Internet, namely faster and better Internet access, which is becoming increasingly important not only for business competitiveness, but also for supporting social inclusion. [7] The development of society depends to some extent on the use of broadband networks, thus these services become absolutely necessary to maintain and increase the quality of everyday life.

The indicator we use in our analysis shows the percentage of high-speed Internet users (over 100 megabits per second) in Romania compared to the European Union average, the group of leading innovative countries and the group of emerging innovative countries.

Figure 3. Penetration of broadband Internet services Romania – EU

Source: <https://ec.europa.eu/eurostat/data/database>

Regarding the penetration of broadband internet services, Romania had an upward evolution during the last 9 years, registering a spectacular increase in 2014 with over 40% compared to 2013. This increase was due to the introduction of 4G technology in Romania, a technology that offered broadband internet speeds of up to 150 Mbps [3], the transition from analogue to digital television and access to European funds, through the RO-NET project [6], for the expansion of broadband internet in rural areas for economic reasons and social inclusion. Since 2014, our country has consistently exceeded the European Union average, reaching 88.6% broadband Internet users in 2021, compared to 82.10%, which was the average of EU countries.

Figure 4. Penetration of broadband internet services Romania – group of emerging innovative countries – group of leading innovative countries

Source: author own processing, <https://ec.europa.eu/eurostat/data/database>

The evolution of the analysed indicator is increasing both in Romania and in the groups of leading and emerging innovative countries. As an absolute novelty we can observe that in 2021 Romania even exceeded the average of the group of leading innovative countries by 2.30%.

In addition to the investments made to expand broadband internet services in Romania, one explanation could be that our country has the lowest price for these services in the European Union, followed by Lithuania, Poland and Bulgaria. [5]

Therefore, almost 89% of the Romanian population has access to the Internet. Efforts to reduce costs and make the Internet accessible (Romanians pay 1.1% of income for the Internet) have led to an increase in education and the consumption of digital products. We believe that it is necessary to strengthen trust in digital services. To do this, standards must be set and information provided. Users should know (especially from a legal point of view) what it means to issue an electronic invoice, sign an electronic contract, the legal value of a digital signature, the rights and obligations of processing personal data.

3. CONCLUSIONS

Romania is an emerging innovative country, occupying the last place in the European Union in the field of innovation, with an innovation performance well below the EU average. We believe that the existing research-development-innovation system in Romania is not able to ensure overcoming the condition of a modest innovator, due to some of its weaknesses, among which the most important are: extremely low R&D expenses, compared to innovative countries leader and even with the average of the European Union, the excessive priority given by some institutes to fundamental research, to the detriment of applied research, the lack of adequate incentives in favor of CDI, the lack of a periodic analysis of the real correlation between the needs of Romanian society and the priority programs as a research direction within national programs.

In conclusion, we can say that thanks to recent developments, the next "normal" world will be more digital than today. The transformations that society has gone through in the last two years have shown how important digitization is for national economies, allowing the continuation of work and economic activities in many sectors of activity, and the fact that our country is a leader in the penetration of broadband Internet services is an advantage. Pandemic restrictions have accelerated citizens' use of digital services and forced companies and governments to adjust how they interact with them. Many business decision-makers have seen digitization as a necessary step forward, but to successfully achieve digital transformation, companies need a holistic approach, digitizing interactions and optimizing customer operations.

REFERENCES

1. Artige, L., (2022), *Innovation*, Book: The Palgrave Encyclopedia of the Possible, Publisher: Springer, disponibil la https://www.researchgate.net/publication/358780569_Innovation
2. Asociația Patronală a Industriei de Software și Servicii, *Studiu-asupra-economiei-digitale-din-România*, disponibil la https://anis.ro/wp-content/uploads/Studiu-asupra-economiei-digitale-din-Romania_2021-1.pdf
3. <https://www.ancom.ro>
4. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive: High-tech_statistics_-_economic_data](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Archive:_High-tech_statistics_-_economic_data)

5. <https://digital-strategy.ec.europa.eu/en/library/digital-economy-and-society-index-desi-2022>
6. <https://gov.ro/ro/print?modul=sedinte&link=strategia-nationala-privind-agenda-digitala-pentru-romania-2020>
7. <https://op.europa.eu/webpub/eca/special-reports/broadband-12-2018/ro/>
8. <https://www.techopedia.com/definition/7576/high-tech>