Dika-Krluku, N. (2024). North Macedonia as an emerging innovator, *SCIENCE International journal, 3*(1), 183-188.
doi: 10.35120/sciencej0301183d UDK: 001.895:303.71(497.7)"2016/2023"
001.895:303.71(4-672EU)"2016/2023"

NORTH MACEDONIA AS AN EMERGING INNOVATOR

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Abstract: Innovation plays a vital role in advancing economic growth, benefiting consumers, businesses, and the overall economy. Economically, it involves the creation of new products and/or services, the implementation of novel ideas to enhance goods and services, or the integration of new technologies into production processes. Therefore, to thrive in the business world, organizations must innovate. Their survival hinges on the ability to introduce innovations, essential for maintaining a stable and attractive position in the market. Innovations can happen in any area or level of an organization – from manufacturing a tiny electronic component, to introducing a groundbreaking product line, to creating a disruptive business model. Another significant aspect to consider is the impact of government policies on innovation. Hence, its support for businesses is crucial. The purpose of this paper is to examine North Macedonia's innovation standing within the EU relative to other countries in the region. It aims to analyze the trends over the years, identify the factors influencing performance, assess the reasons behind the results, highlight the country's strengths, and pinpoint areas that need improvement to align with countries with higher innovation scores, as assessed by the European Innovation Scoreboard (EIS). The EIS offers a comparative evaluation of the research and innovation performance among European countries. North Macedonia's indicator (46.3) ranks among the lowest, although there has been a significant improvement in the last year, narrowing the difference performance and that of the EU. However, there is still much work to be done. The study's purpose is to identify the areas on which businesses and the government should focus in the future.

Keywords: Innovation, business, government, performance
Field: Economy

1. INTRODUCTION

Innovation encompasses the introduction of novel or improved products, services, processes, methods, or organizational approaches within business operations, workplace structures, or external interactions. It extends beyond research and development, encompassing a wide array of activities aimed at enhancing firms' productivity and competitiveness. Consequently, innovation is recognized as a vital catalyst for economic growth. Structural measures to foster innovation include boosting spending on research and development (R&D), investing in education, facilitating easier business startup for entrepreneurs, and enabling swift market exit for unsuccessful ventures. Moreover, companies can promote innovation by investing in their workforce and conducting internal R&D initiatives.

The idea that innovation is central to economic and social advancement is now widely embraced. Consequently, many countries, including numerous low- and middle-income nations, have incorporated innovation policies into their national frameworks. This shift reflects the growing recognition of the significance of innovation and innovation capacities in developing countries. Although progress was initially sluggish, especially at the turn of the millennium, it has accelerated significantly over the past two decades.

Annually, the UN's World Intellectual Property Organization (WIPO) assesses countries' economic innovation through the Global Innovation Index (GII), a practice initiated since 2007. The GII evaluates 132 economies worldwide, utilizing 80 indicators to assess their innovation capacities and accomplishments, encompassing various factors like research and development (R&D) spending, market competitiveness, patent systems, productivity, and local human capital.

On the other hand, the European Commission introduced their interactive tool in 2007 - the European Innovation Scoreboard (EIS), which aids EU countries to determine their relative strengths and weaknesses in their domestic innovation frameworks, highlighting areas for improvement. EU countries are then classified into four performance categories based on their evaluations: Innovation leaders, Strong innovators, Moderate innovators, and Emerging innovators. North Macedonia is positioned within the fourth group.

This study aims to pinpoint the factors contributing to this outcome by analyzing the detailed report for North Macedonia. It will examine viewpoints to improve performance from both business and government angles.

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2. MATERIALS AND METHODS

The European Innovation Scoreboard compares how well European countries – EU Members (27), other EU countries (11) as well as nearby regions perform in research and innovation. It helps countries understand where they excel and where they need to improve in innovation, making it easier to identify challenges.

The overall performance index per country known as the Summary Innovation Index, is obtained from 32 indicators across 12 categories, distinguishes between 4 main types of activities – **Framework conditions, Investments, Innovation activities,** and **Impacts.**

The dimensions addressed in these types of activities include:

• **Framework conditions** – External firm factors driving innovation: Human Resources, Attractive Research Systems and Digitalization

• **Investments** - investments made within the public and private sectors, through these dimensions: Finance and Support, Firm Investment in Research & Development and Use of Information Technologies

• **Innovation activities** – assessment of different aspects of innovation such as: Innovators, Linkages and Entrepreneurial Discovery and Intellectual Assets.

• **Impacts** - the impacts of enterprises' innovation activities focusing on: Sales Impacts, Employment Impacts and Environmental sustainability

Countries are categorized into four performance groups based on their scores relative to the EU average:

• **Innovation Leaders** – countries with performance exceeding 125% of the EU AVG

• **Strong Innovators** - countries with performance ranging from 100% to 125% of the EU AVG

• **Moderate Innovators** - countries with performance ranging from 70% to 100% of the EU AVG.

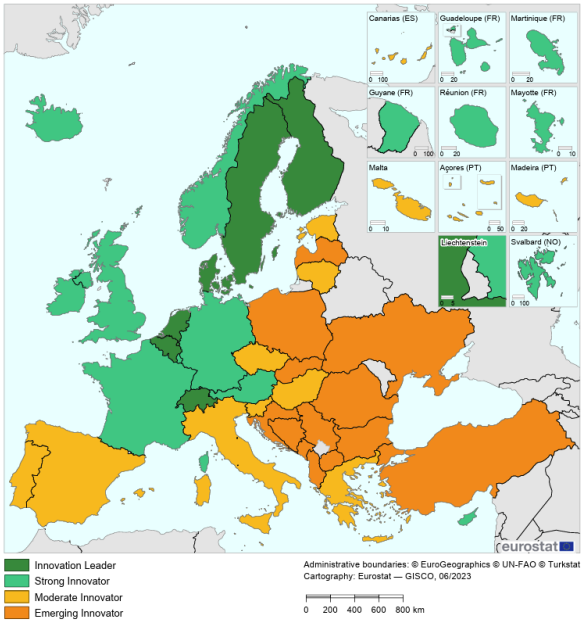
• **Emerging Innovators** - countries with performance below 70%. North Macedonia is among them

Regarding data sources, The EIS utilizes the latest statistics sourced from Eurostat, the OECD, the United Nations, and other internationally recognized data providers available at the time of analysis. The latest edition of the EIS, published on July 6, 2023, from which the results were derived, was prepared using available data up until the end of April. The methodology is detailed in the published report.

3. RESULTS

According to the most recent EIS report, Innovation Leaders and Strong Innovators are predominantly clustered in Northern and Western Europe, while Moderate and Emerging Innovators are primarily found in Southern and Eastern Europe (Figure 1).

Figure 1:

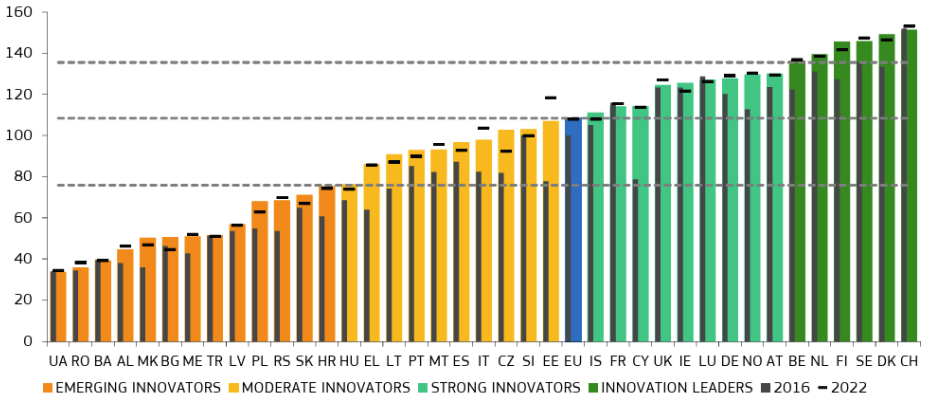


Source: Source: European Innovation Scoreboard 2023: executive summary. Publications Office of the European Union. https://op.europa.eu/en/publication-detail/-/publication/5d1b30d5-1ba9-11ee-806b-01aa75ed71a1/language-en

Switzerland remain Innovation Leader with the overall best performing score in Europe. In 2023, it was observed that Denmark achieved remarkable results, surpassing Sweden to become the new top innovator.

Between 2016 and 2023, performance gaps among few countries narrowed, especially within Strong and Moderate Innovators, yet geographic concentration persists in performance distribution (Figure 2)

Figure 2:



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North Macedonia is classified as an **Emerging Innovator**, with its performance standing at **46.3%** of the EU average, among others where Croatia leads. Its performance has surged, surpassing the EU's growth rate by 8.5% points and reducing the performance disparity with the EU. Moreover, North Macedonia's performance improvement (14.5 %) outpaces the EU's since 2016 and exceeds all EU countries' improvements (by 3.4 % points) compared to 2022.

In the detailed EIS report for North Macedonia, robust growth is attributed to performance increases in foreign doctorate students, Environment-related technologies and Non-R&D Innovation expenditures. Higher improvements compare to 2016 and 2022 are noticed in Environmental sustainability and Attractive research systems dimensions precisely because of the above-mentioned indicator improvements (Figure 3)

The report highlights several pain points, including finance and support category, as well as intellectual assets. Compared to 2016, there has been a decrease in ICT trainings, R&D costs in the public sector, and collaboration of innovative SMEs. Furthermore, compared to 2022, a higher decrease is observed in job-to-job mobility of HR in Science and Technology. (Figure 3)

Figure 3:

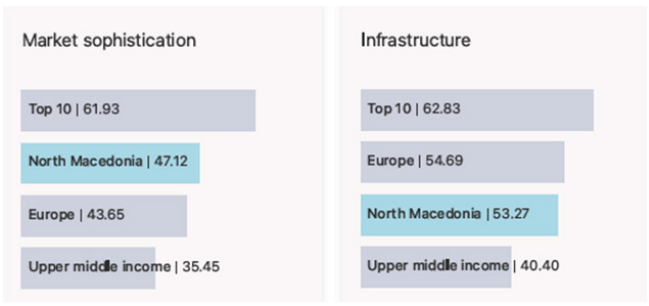
North Macedonia	Performance relative to EU in 2023	Performance change 2016-2023	Performance change 2022-2023
SUMMARY INNOVATION INDEX	**46.3**	**14.5**	**3.4**
Human resources	**32.8**	**8.7**	**0.0**
Doctorate graduates	11.0	-11.4	0.0
Population with tertiary education	75.1	42.5	0.0
Lifelong learning	8.8	0.0	0.0
Attractive research systems	**84.8**	**76.4**	**19.2**
International scientific co-publications	25.5	21.5	7.9
Most cited publications	48.2	29.6	21.6
Foreign doctorate students	228.7	234.8	24.3
Digitalisation	**43.2**	**1.8**	**0.0**
Broadband penetration	61.3	3.5	0.0
People with above basic overall digital skills	18.4	0.0	0.0
Finance and support	**15.6**	**-4.3**	**0.1**
R&D expenditures in the public sector	25.0	-12.9	0.0
Venture capital expenditures	N/A	N/A	N/A
Government support for business R&D	6.7	8.0	0.2
Firm investments	**40.0**	**0.5**	**0.0**
R&D expenditure in the business sector	3.5	1.5	0.0
Non-R&D Innovation expenditures	114.5	0.0	0.0
Innovation expenditures per employee	14.4	0.0	0.0
Use of information technologies	**32.8**	**-5.6**	**0.0**
Enterprises providing ICT training	42.0	-29.3	0.0
Employed ICT specialists	23.3	17.2	0.0
Innovators	**60.0**	**5.3**	**0.0**
Product innovators (SMEs)	49.2	-4.8	0.0
Business process innovators (SMEs)	69.5	16.0	0.0
Linkages	**50.0**	**34.9**	**-16.5**
Innovative SMEs collaborating with others	46.0	-11.4	0.0
Public-private co-publications	28.2	23.9	3.9
Job-to-job mobility of HRST	62.5	82.4	-41.2
Intellectual assets	**14.4**	**9.0**	**-2.0**
PCT patent applications	13.3	12.0	-9.7
Trademark applications	28.2	14.7	7.5
Design applications	1.0	0.8	0.4
Employment impacts	**30.7**	**8.2**	**0.0**
Employment in knowledge-intensive activities	18.1	16.9	0.0
Employment in innovative enterprises	41.0	0.0	0.0
Sales impacts	**68.8**	**16.6**	**-2.1**
Medium and high-tech goods exports	111.8	16.4	-8.7
Knowledge-intensive services exports	55.1	30.1	4.4
Sales of innovative products	22.6	0.0	0.0
Environmental sustainability	**87.3**	**29.2**	**43.3**
Resource productivity	38.2	15.7	0.0
Air emissions by fine particulate matter	N/A	N/A	N/A
Environment-related technologies	161.8	44.8	82.1

Source: European Innovation Scoreboard 2023: executive summary. Publications Office of the European Union. https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

On the other side, based on the Global Innovation Index (GII) latest report, North Macedonia ranks 54th among the 132 world economies and 33rd among the 39 economies in Europe, which is considered a commendable achievement. It is recognized as a developing economy that has exceeded expectations based on its level of development. Compared to the previous year, there has been a noticeable improvement in rankings: North Macedonia was ranked 57th in 2020, 59th in 2021, and 66th in 2022.

North Macedonia has demonstrated satisfactory performance only in 2 (from 7) areas: Market Sophistication, where it surpasses the EU average, and Infrastructure, where it closely aligns with the EU average.

Figure 4:



Source: North Macedonia ranking in the Global Innovation Index 2023. retrieved from https://www.wipo.int/edocs/pubdocs/en/wipo-pub-2000-2023/mk.pdf

The areas where performance is below the EU average and warrants attention are: Knowledge & Technology Outputs, Creative Outputs, Human Capital, and Institutions.

Otherwise, the top-ranking innovative economies in 2023 include Switzerland, maintaining its leading position for the 13th consecutive year, followed by Sweden, the United States, the United Kingdom, and Singapore.

4. DISCUSSIONS

Despite differences (in purpose, coverage, and methodology), both benchmarking reports highlight similar aspects for North Macedonia. The GII report emphasizes indicators with lower scores, such as policies for doing business and university-industry R&D collaboration, while the EIS report outlines weaknesses in design applications, R&D expenditure in both the business and public sectors, and government support for business.

North Macedonia has consistently been positioned at the lowest group since joining the European Innovation Scoreboard (EIS) in 2010 – then called "Modest Innovators", today "Emerging Innovators", indicating a stagnant position compared to the EU's innovation community. This underscores the necessity for continued undertakings in investing in R&D and human capital along with reinforcing institutional support, to stimulate innovation and foster economic growth.

Decision-makers and leaders in nations known for their high levels of innovation are investing in innovation within both scientific and industrial sectors to drive economic revitalization. They have implemented diverse strategies to cultivate this innovation-driven growth.

- Location - Establishing innovation-focused industrial clusters or cities is crucial for productivity, skill development, and fostering new enterprises. However, success in creating these clusters with public research institutions has been limited.
- Skills - Enhancing local skill levels is another key to boosting innovation. This can involve attracting skilled migrants or investing in training programs for the local workforce.
- Finance - Increasing funding for research and development, universities, and technology commercialization is essential for driving innovation.
- Technology - Government investment in emerging technologies like drones, AI, blockchain, and robotics is pivotal for innovation.

Creating innovation policy is seen as a fundamental aspect of the economic strategy of the North Macedonian Government. The goal of the Innovation Strategy is to initiate the nation's transition into a knowledge-based economy, enabling it to compete on a global scale by leveraging its skilled workforce and innovative businesses. To achieve this vision, four strategic objectives have been outlined:

- Objective 1 – increasing the tendency of the business sector for innovation;
- Objective 2 – enhancing human capital for innovation;
- Objective 3 – establishment of a regulatory framework conducive to innovation;
- Objective 4 – increasing knowledge flows between innovation participants

Additionally, the establishment of the Fund for Innovation and Technological Development (FITR) has provided crucial financial support to startups and innovative companies. Currently, through its financial instruments, FITR co-finances 686 projects with a joint investment of 86 million euros.

On the other hand, BAU, known as the Business Accelerator UKIM, is a prominent accelerator focused on nurturing promising technology startups, entrepreneurs, and scale-ups in Macedonia. It offers support through financing and personalized business acceleration programs. Additionally, BAU serves as the National Secretary for the European Institute of Innovation and Technology (EIT) in North Macedonia. The EIT aims to enhance collaboration among businesses, educational institutions, and research organizations, fostering regional competitiveness and sustainable economic growth.

5. CONCLUSIONS

In conclusion, although North Macedonia has seen some progress in promoting and supporting innovation, greater concerted efforts are necessary to improve its position within the EU's innovation community. To promote innovation effectively, structural measures are required. These include enhancing investments in research and development (R&D), bolstering educational opportunities, streamlining the process for new business establishment, and facilitating prompt exits for unsuccessful ventures. Moreover, companies can contribute significantly to fostering innovation by investing in their workforce and engaging in their own research and development initiatives.

The government should prioritize implementing strategies effectively, increasing awareness

about innovation's importance, and integrating research outcomes into the national innovation strategy. Additionally, fostering collaboration between organizations like FITR and BAU can offer essential resources for innovation, enabling international market inclusion and cooperation with regional innovators, thus promoting sustainable economic growth.

By pursuing these initiatives with commitment, North Macedonia can unlock its full potential and thrive in the ever-evolving innovation-driven economy

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