DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

INNOVATION AS A TOOL FOR SUSTAINABLE DEVELOPMENT OF EU COUNTRIES

Marina COBAN
PhD, Associate Professor
Academy of Economic Studies of Moldova, MOLDOVA
Email: mcoban.mcoban@gmail.com
ORCID ID: 0009-0005-1984-9682

Abstract: *Innovation creates opportunities for starting new businesses, creating new jobs and contributing to economic development. The article explores the role of innovation and its influence on sustainable economic development. Innovation indicators are examined for different EU countries and disparities in the development of innovation systems are highlighted. The research was conducted based on data provided by the Global Innovation Index and Eurostat across the 27 EU countries. The article focuses on the evolution of the Summary Innovation Index in different EU countries. This index represents the average of 32 indicators in the fields of economy, business environment, governance and public policies, climate change and demographic dynamics. The comparative analysis of the innovation index allowed to highlight innovation leaders and underperforming states, providing useful information to decision-makers to improve the innovation potential of EU countries. In conclusion, it is emphasized that innovation is the engine of sustainable growth and companies must develop innovation strategies in accordance with international and national regulations. Innovation remains a primary factor for the competitiveness of countries and for sustainable economic development.*

Keywords: *Innovation, investment, digitization, sustainable development.*

UDC: *001.895:338.1(4EU)*

Classification JEL: *O31,O52.*

1. Introduction

EU research and innovation policy plays a key role in delivering Europe's recovery plan, paving the way out of the current crisis and towards a fairer future based on economic growth. Insights and breakthroughs from research and innovation play a crucial role in restoring ecosystems, making room for nature, and fundamentally changing the way to operate - paving the way for a more sustainable future in Europe and beyond.

Scientific progress and innovative solutions drive both digital and industrial transitions forward, while also supporting the realization of the Sustainable Development Goals. Innovation enables a rapid shift to a circular economy with a smaller environmental footprint, with cleaner industrial development. To remain a global leader, the EU must uphold high standards for climate action and environmental care.

This article analyses the impact of innovations on the development of EU countries and the evolution of innovation performance over the years. Innovation performance is analyzed through framework conditions, investments, innovation activities and impact.

2. Literature Review

Innovation is the process of transforming an idea into a practical application. Innovation is associated with the implementation of inventions in various spheres of human activity, contributing to the formation of a system of sustainable development of society. As Kahn K.B. (2018) mentions, innovation can be characterized by three different things: innovation is a result, innovation is a process, and innovation is a mentality [1].

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

Countries that create conditions for the generation and implementation of innovations gain competitive advantages [2,3]. Joseph Schumpeter (Josef Schumpeter, 1883–1950) was among the first to highlight the importance of innovation for creating competitive advantages. Competitive advantages are achieved by constantly improving the quality of products, technology, and organization.

Schumpeter defined innovation as a primary factor of economic development.

The essence of innovation consists of:

- novelty of the idea;
- market orientation;
- practical significance;
- increasing economic effects.

Innovation is a complex economic category, including economic, social and environmental aspects [4]. Innovation is one of the objectives of the 2030 Agenda for Sustainable Development.

Innovations are the main factors of economic growth, a source of technological progress and a factor in long-term competition [5]. The development of countries is linked to the knowledge economy and advanced technologies. Many authors Szopik-Depczynska, K. (2020), Mohamed M.M.A. (2022,) note that countries that implement innovative solutions will grow rapidly.

Innovations, as the most important factor of sustainable and effective economic development, cover the national and world economy, and spread to economic, social and ecological aspects of the world community.

The 2030 Agenda for Sustainable Development includes 169 indicators, many of which refer to factors that favor innovation, research and development. The strategies developed and implemented in the EU support the sustainable development of economies that can be achieved through education, innovation and research and development activities (Istudor et al., 2020). Research-development-innovation is the main pillar that connects innovations with market realities, facilitating economic development.

Investment in research and development contributes to sustainable economic growth based on innovative solutions (Sarpong et al., 2022).

Achieving competitive advantages based on knowledge and innovation can guarantee the sustainable socio-economic development of countries.(SzopikDepczyńska et al., 2020). As Szopik-Depczynska, K. (2020) mentions "the assessment of the level of innovation of countries and regions is based on a complex of indicators: human and intellectual resources, public and private financial resources used to develop innovation, the capacity to create innovation, or institutional support for the development of innovation systems".

The issue of disparities in the EU is a topic of interest in the literature (Brodny J, 2023; Constantin, M., 2021, Ionescu, G.H.,2020). The research carried out in this paper is based on the comparative analysis of EU countries according to the innovation index.

3. Methodology

The author used a complex and systemic research approach such as: analysis, synthesis, induction, deduction, scientific abstraction, documentation, and modeling. The research was conducted based on data provided by the Global Innovation Index and Eurostat across the 27 EU countries.

The Global Innovation Index measures innovation performance through four main pillars: framework conditions, investments, innovation activities and impact.

These pillars include several indices, namely [13]:

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

- *Human resources* **(**number of doctoral graduates in science, technology, engineering and mathematics (STEM); percentage of the population aged 25-34 who have completed tertiary education; participation rate of the population aged 25-64 in lifelong learning).
- *Attractive research systems* (international co-publications; publications in the top citations; number of foreign PhD students).
- *Digitalisation* (the proportion of enterprises with access to fixed high-speed internet (minimum 100 Mb/s); the percentage of people with digital skills above the basic level).
- *Finance and support* (investments in venture capital; research and development expenditure carried out by public and academic institutions; direct financial support or tax incentives provided by the government to companies investing in research and development).
- *Firm investments* (private R&D investment; non-R&D innovation spending; innovation spending per employee).
- *Use of information technologies* (development of employees' digital skills; number of employees with ICT expertise).
- *Innovators* (the number of innovations introduced within organizations).
- *Linkages* **(**partnerships between innovative firms; collaborations between the business and public sectors in the field of research; mobility of the scientific and technological workforce (HRST).
- *Intellectual assets* (number of international patent applications (PCT); trademark applications; industrial design applications).
- *Impact on the workforce* (share of employees in knowledge-intensive fields; employment rate in innovative firms).
- *Sales impacts* **(**exports of medium and high-tech products; exports of knowledge-based services; revenues generated by innovative products).
- *Environmental sustainability* (resource productivity; exposure to fine particle air pollution; development of green technologies).

These variables were analyzed and compared between various EU countries for the year 2024 and the dynamics of these indicators were tracked for the period 2017 and 2024.

The comparative analysis of the Global Innovation Index allowed to highlight innovation leaders and underperforming states, providing useful information to decision-makers to improve the innovation potential of EU countries.

4. Results and Discussion

The impact of innovations on sustainable development and economic security is undeniable. An essential direction for achieving sustainable development is to build an innovative and socially focused economic model. Innovations significantly contribute to increasing the economic potential of states, drive long-term progress, support sustainable economic growth and have an impact on the social sphere and the environment.

Investments in innovation represent a strategic investment in the future of all countries, including the countries of the European Union. Through the developed framework programs, the EU aims to achieve such objectives as:

- strengthening Europe's position in science;
- stimulating industrial innovation;
- addressing climate change, renewable energy sources;

DOI: https://doi.org/10.53486/ser2025.04
International Scientific and Practical Conference,
4th Edition, March 27-28, 2025, Chișinău, Moldova

- transforming technological innovations into viable products with real market potential.

The current global crisis has a significant impact on economic development and provides an impetus for innovation activities. In this context, the European Innovation Scoreboard (EIS) presents a comparative assessment of the innovation performance of the EU and its Member States.

According to the European Innovation Scoreboard (EIS), published annually, the level of innovation performance is reflected by the Summary Innovation Index (SII). This index represents the average of 32 indicators that assess various aspects that influence innovation capacity, from various fields such as the economy, business environment and entrepreneurship, innovation profiles, governance and public policies, climate change and demographic dynamics [13].

The Innovation Scoreboard measures innovation performance through four main pillars [13]:

I. Framework conditions;
II. Investments;
III. Innovation activities;
IV. Impact.

The Innovation Scoreboard groups countries into performance categories, depending on how well they perform in relation to the European Union average in 2024 [13]:

- Innovation leaders are countries that perform above 125% of the EU average. In 2024, this group included the following countries: Denmark, Finland, Sweden, and the Netherlands.
- Strong innovators are countries that perform between 100% and 125% of the EU average such as Belgium, Austria, Ireland, Germany, etc.
- Moderate innovators are countries that have a performance between 70% and 100% of the EU average such as: Slovenia, Spain, Italy, Czech Republic, etc.
- Emerging innovators are countries with results below 70% of the EU average such as: Poland, Croatia, Slovakia, Bulgaria, etc.

Figure 1 shows improvement in performance of the EU over time.

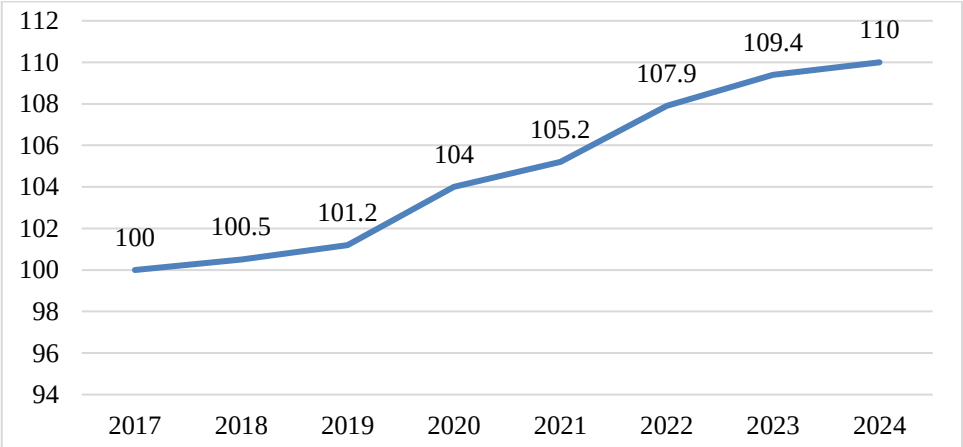

Figure 1. Improvement in performance of the EU over time
Source: research-and-innovation.ec.europa.eu

From 2017 to 2024, the EU's innovation performance increased by 10 percentage points. All EU Member States, except Luxembourg, have made progress in their innovation performance. The pace of this progress differs significantly from one country to

DOI: https://doi.org/10.53486/ser2025.04
International Scientific and Practical Conference,
4th Edition, March 27-28, 2025, Chișinău, Moldova

another. Over the period under review, a group of countries such as Romania, Ireland, France, Slovakia, and others have recorded an increase of less than 5 percentage points.

Eleven Member States have made faster progress, exceeding the EU average growth rate. Of these, Cyprus and Estonia stood out for their rapid pace, with improvements of +39 and +27 percentage points respectively. Figure 2 presents the summary innovation index of Member States in 2024 across the four pillars: framework conditions, investment, innovation activities and impact.

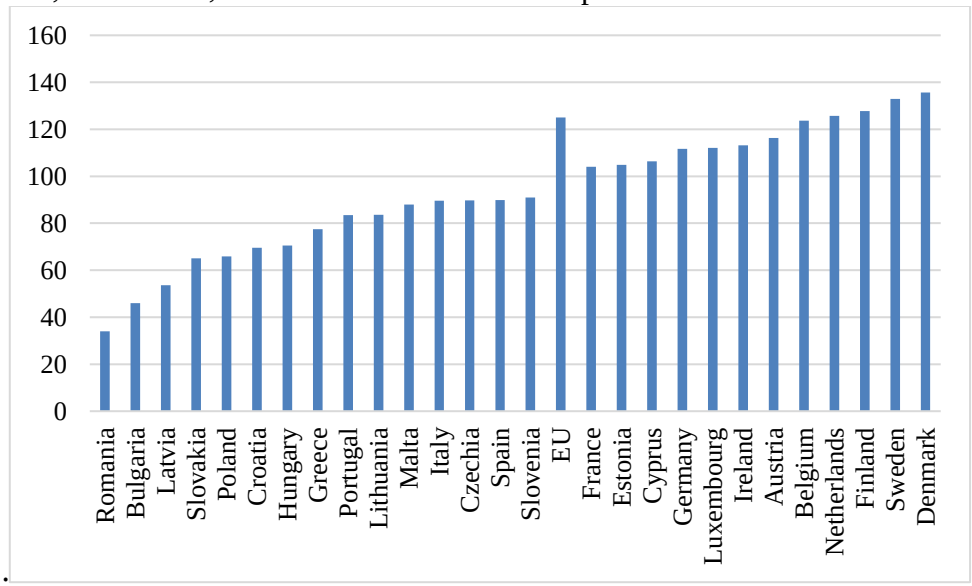

Figure 2. Summary innovation index in 2024 (relative to the EU in 2017)
Source: research-and-innovation.ec.europa.eu

I. Framework conditions

Human resources. This component reflects the availability of a well-trained and educated workforce, assessed by three indicators [13]:

- number of doctoral graduates in science, technology, engineering and mathematics (STEM);
- percentage of the population aged 25-34 who have completed tertiary education;
- participation rate of the population aged 25-64 in lifelong learning.

The best results in this category were recorded by Denmark, Sweden, the Netherlands, Ireland and Luxembourg. Romania, Bulgaria and Hungary were in last place with scores below 50 percentage points, i.e. half of the EU average in 2017.

In the period 2017-2024, the EU average for this dimension increased by 4 percentage points, as a result of progress recorded by 16 Member States. Luxembourg (+27 pp) and Estonia (+23 pp) made the most significant progress. In 11 Member States, performance decreased. The biggest declines were in Slovenia (-29 pp), Finland (-21 pp) and Slovakia (-20 pp).

Attractive research systems. This dimension measures how competitive and attractive a country's scientific base is internationally, taking into account the following indicators [13]:

- international co-publications;
- publications in the top citations;
- number of foreign PhD students.

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

With results twice above the EU average in 2017, countries such as Luxembourg, the Netherlands and Denmark are at the top of this ranking. The lowest scores were recorded by Bulgaria, Poland and Romania, remaining below the 50 percentage point threshold.

Over the period 2017–2024, the EU average increased, as a result of improvements in 24 Member States. The largest increases were recorded in Cyprus (+74 pp), Estonia (+67 pp) and Hungary (+47 pp). Only three countries registered a decline, the most significant being in Belgium (-24 pp).

Digitalisation. This dimension includes the assessment of the degree of penetration of digital technologies through the following key indicators [13]:

- the proportion of enterprises with access to fixed high-speed internet (minimum 100 Mb/s);
- the percentage of people with digital skills above the basic level.

The highest scores were obtained by innovation leaders Finland, the Netherlands, Denmark and Sweden and a moderate innovator - Spain. These countries exceeded the EU average in 2017 by 70%.

At the bottom of the ranking were Greece, Bulgaria and Latvia, with scores below 70 percentage points. Thanks to the progress recorded in 25 countries, the EU average for digitalization increased by 24% between 2017 and 2024. The most significant improvements were made by Cyprus (+75 pp), Finland (+52 pp) and the Czech Republic (+42 pp). Latvia and Belgium recorded decreases, the most pronounced in Latvia (-19 pp).

II. Investments

Finance and support. This dimension refers to the financing of the innovation process by the state, being assessed by three indicators [13]:

- investments in venture capital;
- research and development expenditure carried out by public and academic institutions;
- direct financial support or tax incentives provided by the government to companies investing in research and development.

The top countries in this dimension were France, Belgium (strong innovators) and Denmark (innovation leader), each exceeding the EU average by 50% in 2017. France continues to be at the top, and Denmark entered the top three in 2024. At the opposite end were Cyprus, Malta, Romania, Bulgaria and Latvia with scores below 50 percentage points.

Thanks to improvements in 20 Member States, the average performance of the EU as a whole increased by 17% between 2017 and 2024. The most significant progress was recorded in Denmark (+52 pp), Belgium (+43 pp) and Croatia (+43 pp). On the other hand, the largest decreases were recorded in Ireland (-42 pp) and Luxembourg (-18 pp).

Firm investments. This component reflects the level of companies' innovation spending and includes [13]:

- private R&D investment;
- non-R&D innovation spending;
- innovation spending per employee.

Germany topped the ranking, followed by Belgium and Sweden, with scores 30% above the EU average in 2017. The top is completed by Denmark and the Czech Republic, reflecting a mix of innovation leaders, strong innovators and moderate innovators. The worst performers were Latvia and Romania, with scores below 30 pp.

In 2024, 20 of the 27 Member States were below the EU average in this respect. Among the innovation leaders, only the Netherlands is below the average. Most strong

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

innovators are also below this threshold, with the exception of Austria, Germany and Belgium, which stand out positively. All emerging innovators occupied lower positions in the ranking.

During the period under review, the EU average increased modestly, by 6%. The most significant increases were recorded in Belgium (+42 pp), the Czech Republic (+39 pp) and Estonia (+36 pp). The most significant decreases were recorded in Slovenia (-34 pp), Sweden (-19 pp) and Croatia (-16 pp).

Use of information technologies. This component refers to [13]:

- development of employees' digital skills;
- number of employees with ICT expertise.

In 2024, in this dimension, most Member States exceeded the EU average in 2017.

Finland was the country that stood out with performances twice as high as the EU average, followed by Sweden, the Netherlands, Denmark and Luxembourg. At the opposite end were Greece, Romania and Bulgaria.

Overall, the EU average in this dimension increased by 10% between 2017 and 2024. The largest improvements were recorded in Poland (+51 pp), Cyprus (+41 pp) and the Netherlands (+38 pp). On the other hand, Austria (-28 pp) and Ireland (-24 pp) had the most significant decreases.

III. Innovation activities

Innovators. This component reflects the extent to which product or process innovations are introduced within organizations. In some countries, the pandemic pushed companies to adapt their products and processes and in the end, remarkable results were achieved, such as Greece, Cyprus, Belgium, Italy and Sweden.

Other countries such as Hungary, Malta, Spain, Romania, Poland, Bulgaria, Slovakia and Latvia continued to record results 30% below the EU average in 2017. With the exception of the innovation leaders, the differences in performance among country groups were considerable.

Overall, between 2017 and 2024, the EU average improved by 17%, as a result of progress recorded in 20 countries. The largest increases were recorded in Cyprus (+118 pp) and Greece (+67 pp). However, in seven countries, performance decreased, with the largest declines being in Portugal (-63 pp), Luxembourg (-34 pp) and Finland (-26 pp). [13]

Linkages. This dimension reflects collaborations in the field of innovation, through the following indicators [13]:

- partnerships between innovative firms;
- collaborations between the business and public sectors in the field of research;
- mobility of the scientific and technological workforce (HRST).

The best results were obtained by Cyprus, Denmark and Finland, with scores significantly exceeding the rest of the countries, reaching levels above 275.

On the other hand, some countries that refer to emerging innovators such as Romania, Bulgaria, Slovakia and Poland had the lowest performances, below the EU average in 2017. Ten Member States obtained scores above 200, but the EU average remained relatively low.

In 2024, all innovation leaders and strong innovators exceeded the EU average. Two moderate innovators, Slovenia and Lithuania, and one emerging innovator, Croatia, are above this average. The rest of the moderate and emerging innovators have performed poorly, occupying the lowest positions.

Between 2017 and 2024, the EU's performance in this dimension increased by 36%. Cyprus had the highest increase (+174 pp), followed by several countries with

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

progress above 40%, including Ireland, Italy, Croatia, Hungary and Slovenia. The only countries that regressed are Greece (-8 pp) and Romania (-4 pp).

Intellectual assets. This dimension assesses the performance of states in the field of intellectual property rights, through the following indicators [13]:

- number of international patent applications (PCT);
- trademark applications;
- industrial design applications.

The best performers were Austria, Denmark and Malta. The last places were occupied by Romania, Slovakia, Croatia, Greece, Hungary. Among the strong innovators, five countries are above the EU average (Austria, Germany, Estonia, Luxembourg, Cyprus) and three countries are below this threshold (Belgium, France, Ireland). All moderate innovators are below the EU average, except Malta and Italy. All emerging innovators have underperformed.

Between 2017 and 2024, 18 Member States have regressed and as a result the EU average in this dimension has decreased by 9%. The largest decreases were in Luxembourg (-37 pp), Germany (-19 pp), Denmark (-16 pp), Ireland (-15 pp) and Bulgaria (-16 pp). Nine countries have registered increases, the most obvious being Estonia (+24 pp) and Lithuania (+18 pp).

IV. Impact

Impact on the workforce. This dimension highlights the impact of innovation on the labour market, through the following indicators [13]:

- share of employees in knowledge-intensive fields;
- employment rate in innovative firms.

The best results were achieved by Sweden and Finland, followed by Cyprus, Ireland and Belgium, all with scores over 50% higher than the EU average in 2017. At the opposite end, Romania, Latvia, Slovakia, Bulgaria, Poland, Hungary and Spain had scores below 70, reflecting a modest impact of innovation on employment.

Between 2017 and 2024, the EU average in this dimension increased by 11%, thanks to the progress recorded by 20 Member States. Estonia had the highest increase (+72 pp), followed by Cyprus, Greece, Poland, Finland, Sweden, Croatia, Lithuania and Bulgaria, each with progress of over 20%. In contrast, seven countries saw decreases, the largest being Luxembourg (-32 pp) and Ireland (-15 pp).

Sales impacts. This component analyses the economic contribution of innovation, measured by three main indicators [13]:

- exports of medium and high-tech products;
- exports of knowledge-based services;
- revenues generated by innovative products.

Ireland, a strong innovator, leads the ranking, followed by Germany and Finland. Despite some progress in recent years, Croatia, Latvia, Lithuania, Bulgaria and Poland performed the worst, with scores more than 30% below the EU average in 2017.

Between 2017 and 2024, the European average increased by 5%, supported by improvements recorded by 21 Member States. Finland had the highest increase (+25 pp), and other significant increases (over 10%) were observed in Greece, Denmark, Portugal, Belgium, Croatia, Lithuania, Sweden, Bulgaria, Cyprus and Spain. Six countries recorded declines, with the largest decreases in Luxembourg (-15 pp) and France (-10 pp).

Environmental sustainability. This dimension assesses the negative impact on the environment and includes three important factors:

- resource productivity;

DOI: https://doi.org/10.53486/ser2025.04
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

- exposure to fine particle air pollution;
- development of green technologies.

The best performers in this area were Denmark, the Netherlands, Luxembourg, Germany, Italy and France, which scored 20% better than the European Union average in 2017. In contrast, the last places are occupied by Estonia, Portugal, Romania, Bulgaria and Latvia. While Denmark and the Netherlands continue to be leaders in sustainability, Sweden and Finland fell below the EU average in 2024.

Between 2017 and 2024, the EU average increased by 11%, driven by improved performance in 13 Member States, including Ireland, Belgium, Malta, the Czech Republic and Slovenia, which recorded the greatest progress. In contrast, the largest decreases occurred in Croatia, Romania and Spain.

The performance differences between groups of innovators are significant, with the largest being observed in areas such as the use of information technologies, digitalisation and research, while the differences between moderate and emerging innovators are smaller in dimensions such as the use of information technologies and the impact of sales.

Recognizing the role of innovation in sustainable development, the total budget for innovation activities in European ecosystems was set at EUR 527 million.

5. Conclusions

1. Innovation lays the groundwork for the creation of new businesses, job opportunities, and increased productivity, making it a vital force for economic progress.
2. Economies that foster innovation are better positioned to deliver improved living standards. Enhancing innovation is a crucial goal for nations aiming to achieve greater prosperity and improve quality of life for their citizens.
3. Analyses indicate that EU member states are steadily advancing in the field of innovation. Between 2017 and 2024, the EU's overall innovation performance grew by 10%, largely driven by the continued development of advanced technologies and a supportive climate for start-ups.
4. However, progress varies across member states, with faster improvements seen in countries that are already embracing digital technologies.
5. Despite these advances, the EU still lags behind global competitors in terms of investment in research and innovation, particularly from the private sector.
6. Innovation remains a key factor for long-term competitiveness, as it boosts productivity growth in a context of environmental sustainability and macroeconomic stability.

6. References

1. KAHN, K.B. *Understanding innovation*. Business horizons. 2018, 61, 453–460. https://doi.org/10.1016/j.bushor.2018.01.011
2. GHERGHINA, C., BOTEZATU, M.A., HOSSZU, A., SIMIONESCU, L.N., *Small and mediumsized enterprises (SMEs): the engine of economic growth through investments and innovation.* 2020, Sustainability 12, 347. https://doi.org/10.3390/su12010347
3. OBER, J. *Open innovation in the ICT industry: substantiation from Poland.* Journal of Open Innovation: Technology, Market, and Complexity. 2022, 8, 158. https://doi.org/10.3390/joitmc8030158
4. NOVAKOVIĆ, V.; PEULIĆ, V.; MATIJEVIĆ, G. *Innovation as an initiator of economic development.* Economy and market communication review. 2020, *10*, 230–249. https://doi.org/ 10.7251/EMC2001230N

DOI: *https://doi.org/10.53486/ser2025.04*
International Scientific and Practical Conference, 4th Edition, March 27-28, 2025, Chișinău, Moldova

1. 5.VOEGTLIN, C.; SCHERER, A.G. *Responsible Innovation and the Innovation of Responsibility: Governing Sustainable Development in a Globalized World*. Journal of Business Ethics.2017, *143*, 227–243. https://doi.org/10.1007/s10551-015-2769-z
7. SZOPIK-DEPCZYNSKA, K., CHEBA, K., BAK, I., KEDZIERSKA-SZCZEPANIAK, A., SZCZEPANIAK, K., IOPPOLO, G., *Innovation level and local development of EU regions. A new assessment approach*. 2020, Land Use Policy 99, 104837. https://doi.org/10.1016/j.landusepol.2020.104837
8. *MOHAMED, M.M.A., LIU, P., NIE, G., 2022. Do knowledge economy indicators affect economic growth? Evidence from developing countries.* Sustainability 14, 4774. https://doi.org/10.3390/su14084774
9. ISTUDOR, N., DINU, V., GOGU, E., PRADA, E.-M., AND PETRESCU, I.-E., 2020. *Impact of Education and Economic Growth on Labour Migration in the European Union. A Panel Data Analysis*. E&M Economics and Management, 23(4), pp.55–67. https://doi.org/ 10.15240/tul/001/2020-4-004.
10. SARPONG, D., BOAKYE, D., OFOSU, G., BOTCHIE, D., 2022. *The three pointers of research and development (R&D) for growth-boosting sustainable innovation system.* Technovation 13, 102581. https://doi.org/ 10.1016/j.technovation.2022.102581
11. BRODNY J., TUTAK M., GREBSKI W.,BINDZÁR P. *Assessing the level of innovativeness of EU-27 countries and its relationship to economic, environmental, energy and social parameters.* Journal of Open Innovation: Technology, Market, and Complexity. Volume 9, Issue 2,June 2023, 100073 https://doi.org/10.1016/j.joitmc.2023.100073
12. CONSTANTIN, M., DINU, M., PĂTĂRLĂGEANU, S.R. AND CHELARIU, C., 2021. *Sustainable Development Disparities in the EU-27 Based on R&D and Innovation Factors*. Amfiteatru Economic, 23 (Special Issue No. 15), pp. 948-963. https://doi.org/ 10.24818/EA/2021/S15/948
13. IONESCU, G.H., FIROIU, D., PIRVU, R., ENESCU, M., RADOI, M.-I., COJOCARU, T.M., 2020. *The Potential for Innovation and Entrepreneurship in EU Countries in the Context of Sustainable Development*. Sustainability,12(18),pp.7250. https://doi.org/10.3390/su12187250.
14. European Commision. *European Innovation Scoreboard 2024. [online]*. 2024. [viewed 10 February 2025]. Available from: https://research-and-innovation.ec.europa.eu.