

INNOVATION, A PILLAR OF SUSTAINABLE DEVELOPMENT IN ROMANIA

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ABSTRACT: The whole world is constantly changing. We are going through a period marked by challenges that will directly influence humanity. The phenomenon of globalization has come with benefits but also with negative side effects, creating uncertainties and inequalities in social, economic, political and environmental. The great crisis of 2008-2009 had a major negative impact on the economies of the world, and it is still difficult to recover the losses caused. At present, there is an increased emphasis on social and environmental issues, aiming as much as possible towards a sustainable society. With a decade left, the world is working to meet the 17 United Nations Sustainable Development Goals by 2030. But the challenge is huge, given the current difficult geopolitical and geoeconomic context. The requirements for sustainable development need excellence in innovation. This paper aims to present Romania's current position on the European map of innovation, as well as perspectives that can influence the future evolution of the national economy in the context of sustainable development.

KEY WORDS: innovation, sustainability, development, performance

1. INTRODUCTION

According to the 2020 World Economic Forum (WEF) report, the main geopolitical risks are the failure of national and global governance, interstate conflict, terrorist attacks, state collapse and the proliferation of weapons of mass destruction. Despite the general uncertain global context, a progress made in recent years in Romania should be highlighted. Data published by Eurostat show that Romania's gross domestic product calculated at purchasing power parity increased from 52% of the EU average in 2010 to 66% in 2018 [2], which indicates economic growth. At a first assessment, it can be stated that this positive evolution demonstrates Romania's ability to successfully implement the objectives of the national strategy for sustainable development 2030. However, analyzing carefully there is a risk that Romania may not meet all 17 objectives. One of the objectives of the current strategy for sustainable development is related to industry, innovation and infrastructure. Innovation is the determining pillar of competitiveness, the engine of productivity, energy efficiency and consumption efficiency, increasing the

performance of goods and services and generating new markets. [1]

In order to analyze Romania's innovation performance, we must look at innovation performance at European level. In this way, it can be determined Romania's position on the European map, being able to identify the strong and weak points, where considerable efforts must be made to support this process of innovation-based sustainability.

2. INNOVATION PERFORMANCE IN EU MEMBER STATES AND IN ROMANIA

The Innovation Scoreboard in the European Union is published annually and presents a comparative study of innovation performance in EU Member States, identifying strengths and weaknesses of national innovation systems. The 2019 report presents the results that the states have officially registered on three types of innovation indicators: Framework conditions, Investments, Innovation activities, Impacts. Ten dimensions of innovation were taken into account, developing a total of 27 indicators, as shown in table no. 1.

Table no. 1 Innovation indicators in the European Union

Type/ Dimension/ Indicator
1. Framework conditions
1.1. Human Resources
1.1.1 New doctorate graduates
1.1.2 Population aged 25-34 with tertiary education
1.1.3 Lifelong learning
1.2. Attractive research systems
1.2.1 International scientific co-publications
1.2.2 Top 10% most cited publications
1.2.3 Foreign doctorate students
1.3. Innovation-friendly-environment
1.3.1 Broadband penetration
1.3.2 Opportunity-driven entrepreneurship

2. Investments
2.1. Finance and support
2.1.1 R&D expenditure in the public sector
2.1.2 Venture capital expenditures
2.2. Firm investments
2.2.1 R&D expenditure in the business sector
2.2.2 Non-R&D innovation expenditures
2.2.3 Enterprises providing training to develop or upgrade ICT skills of their personnel
3. Innovation activities
3.1. Innovators
3.1.1 SMEs with product or process innovations
3.1.2 SMEs with marketing or organisational innovations
3.1.3 SMEs innovating in-house
3.2. Linkages
3.2.1 Innovative SMEs collaborating with others
3.2.2 Public-private co-publications
3.2.3 Private co-funding of public R&D expenditures
3.3. Intellectual assets
3.3.1 PCT patent applications
3.3.2 Trademark applications
3.3.3 Design applications
4. Impacts
4.1. Employment impacts
4.1.1 Employment in knowledge-intensive activities
4.1.2 Employment fast-growing enterprises of innovative sectors
4.2. Sales impacts
4.2.1 Medium and high-tech product exports
4.2.2 Knowledge-intensive services exports
4.2.3 Sales of new-to-market and new-to-firm product innovations

The indicators mentioned above aim to establish the innovation performance of EU states. The average of the 27 indicators forms the *Summary Innovation Index*, on the basis of which EU member states are classified in four categories, depending on their level compared to the European average (2017). According to the results published in the European Innovation Scoreboard 2019, the 4 categories are as follows:

- **Innovation Leaders**- includes Member States where performance is above 120% of the EU average. The Innovation Leaders are Denmark, Finland, Luxembourg, the Netherlands and Sweden.
- **Strong Innovators**- includes Member States with a performance between 90% and 120% of the EU average. Strong Innovators are Austria, Belgium, Estonia, France, Germany, Ireland, and the United Kingdom.
- **Moderate Innovators**- includes Member States where performance is between 50% and 90% of the EU average. Latvia, Lithuania, Malta, Poland, Portugal, Slovakia, Slovenia and Spain belong to this group.
- **Modest Innovators**- includes Member States that show a performance level below 50% of the EU average. This group includes Bulgaria and Romania.

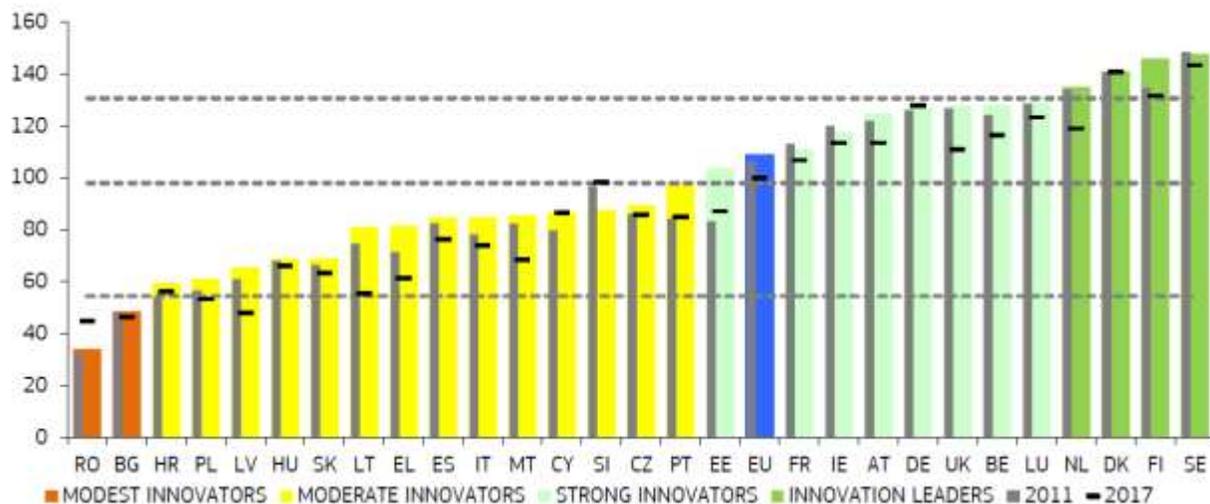


Figure no. 1 Performance of EU Member States' innovation systems [3]

Although many countries have improved their innovation system in 2011-2018, Romania fails to get out of the category of modest innovators, registering even the weakest results in the EU. Given that, in the period 2011-2018, at EU level, the innovation performance improved on average by 8.8%, Romania, together with Slovenia, registered the largest decrease, with over 10%. It should be mentioned, however, that in Romania after four years of declining, performance increased again in 2015, 2016 and 2017.

In the context of sustainable development, the problem is that this trend is to accentuate the divergence, which indicates the risk of non-implementation the objectives and targets set by the Agenda 2030, at least in the field of development-research-innovation.

Analyzing the four performance groups it was observed that the Innovative Leaders perform best in almost all 10 dimensions. Of course, Modest Innovators presents the weakest results and gaps reported both at the EU average and in relation to the values recorded by the other 3 groups. Compared to the states from the group of immediately superior innovators, respectively Moderate Innovators, performance differences are relatively small for: *Innovation-friendly-environment*, *Intellectual assets* and *Employment impacts*. Relatively high performance differences have been registered for *Firm Investments* and *Innovators*.

In 2018, for Romania, performance in *Innovation-friendly-environment* is a relatively strong dimension, exceeding both the level of the previous year and that of 2011. Analyzing only this dimension Romania would be placed in the Moderate Innovators group. Innovation-friendly-environment is measured by the two indicators, Broadband penetration and Opportunity-driven entrepreneurship, which study the environment in which enterprises operate.

Broadband penetration measures the share of enterprises that have access to the fastest fixed connection internet. Broadband and digital services infrastructure is one of Romania's actual action, becoming increasingly important in terms of sustainability because it is helping social inclusion. It has been adopted the National Strategy for the Implementation of 5G and the National Plan for Next Generation Network infrastructure development, which aim to develop fiber networks as close as possible to the end user. The positive evolution of this indicator is due to national and regional broadband financial instruments. The European Bank for Reconstruction and Development (EBRD) provided a 225 million euro loan to Cosmote Romania, a telecommunications company. Also, Romania has launched the Ro-NET project, a project of over 85 million euro, financed from EU funds, which aims to improve the high-speed internet infrastructure in disadvantaged localities in the country.

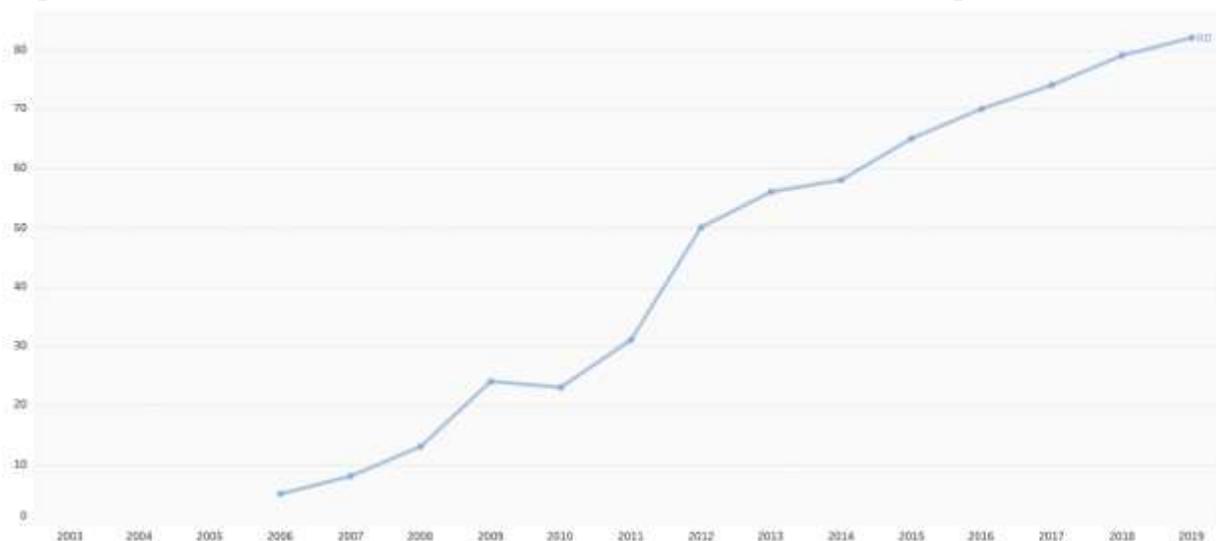


Figure no. 2 Broadband – households having access to the internet in Romania

The indicator Opportunity-driven entrepreneurship measures the level at which individuals engage in entrepreneurial activities as they see new opportunities. Romania is concerned and focuses its efforts on encouraging entrepreneurship. Through the national strategy for sustainable development, entrepreneurship is recognized as one of the key factors for smart, sustainable and inclusive growth. In other words, the development of entrepreneurship is an essential factor in promoting technological initiative, innovation and not least an important source for creating new jobs [4]. The Ministry for Business Environment,

Trade and Entrepreneurship has encouraged this field, by setting up and running the Program for stimulating the establishment of small and medium enterprises "Start-up Nation - Romania" which provides funding for 2017-2020, a maximum annual number of 10,000 beneficiaries. According to statistical data from the National Office of the Trade Register, there was an increase in the number of registrations between October and December 2018 compared to previous years in terms of limited liability companies, an increase that could have been determined by the Start-up Nation program.

Table no. 2 Registration of limited liability companies in Romania

Year	October	November	December
2017	6.781	6.285	4.695
2018	9.031	9.961	8.681

Generally analyzing and comparing to 2017 *Firm investments* dimension, which includes three indicators of both R&D and non R&D investments that firms make to generate innovations and the efforts enterprises make to upgrade the ICT skills of personnel, performance has declined for Romania with 6.9%, being one of the strongest decline from all UE states.

Although the level of spending on research - development - innovation (RDI) has increased slightly, the share of GDP is low compared to that of the Innovation Leaders group. According to the National Institute of Statistics INS, in the period 2007-2018 the level was constantly below 0.51% of GDP. Regarding the

public sector, research investments do not exceed 0.21%, the percentage decreasing considerably from the level registered in 2008. The duration and depth of these developments have led researchers in Romania to go to more developed countries where the interest shown by the economic environment on research and development and innovation is higher. In the private sector, investments in research have increased slightly due to the granting of fiscal facilities to companies and financing through various National Programs. But the problem remains related to the divergence from the EU average, which in 2018 was 1.41% of GDP (as shown in figure no. 3).

Table no.3 R&D expenditure as GDP percentage/ GDP share of public and business sector R & D expenditure

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
R&D expenditure as GDP percentage	0.52	0.57	0.46	0.45	0.49	0.48	0.39	0.38	0.49	0.48	0.50	0.51
GDP share of public sector R&D expenditure	0.30	0.40	0.27	0.28	0.31	0.29	0.27	0.22	0.27	0.21	0.21	0.21
GDP share of business sector R&D expenditure	0.22	0.17	0.19	0.17	0.18	0.19	0.12	0.16	0.22	0.27	0.29	0.30

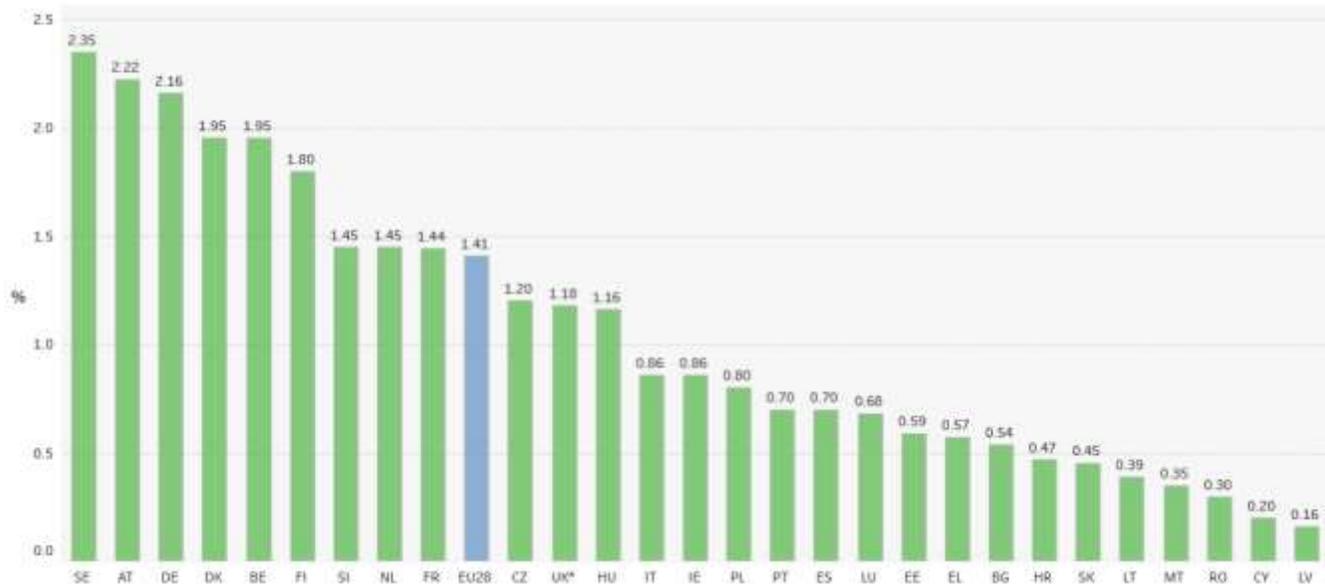


Figure no.3 Business sector R&D expenditure (% of GDP) [5]

By comparing states' performance from Moderate Innovators group and states' performance from Modest Innovators group, a relatively high difference has been registered in *Innovators* dimension. The three indicators measuring the share of firms that have introduced innovations onto market or within their organizations, marketing and organisational innovators, and SMEs that innovate in house, have been recorded significantly high differences, meaning in the states with modest innovation system the SMEs are not focused on innovation at all. According to the results of the Community Innovation Survey 2016 (most

recent year for which data are available and were taken in account in the calculation of Summary Innovation Index), in the period 2014-2016, the EU registered an increase of 3%, reaching a percentage of 51% in terms of enterprises of 10 or more employees who reported innovative activity. The share of innovative enterprises strongly increased in Portugal and Finland. As seen in figure no. 4, the ranking is occupied by Belgium, Portugal and Finland, where over 65% of the enterprises show high innovation activity. Well below the EU average, with a share of only 10% is Romania.

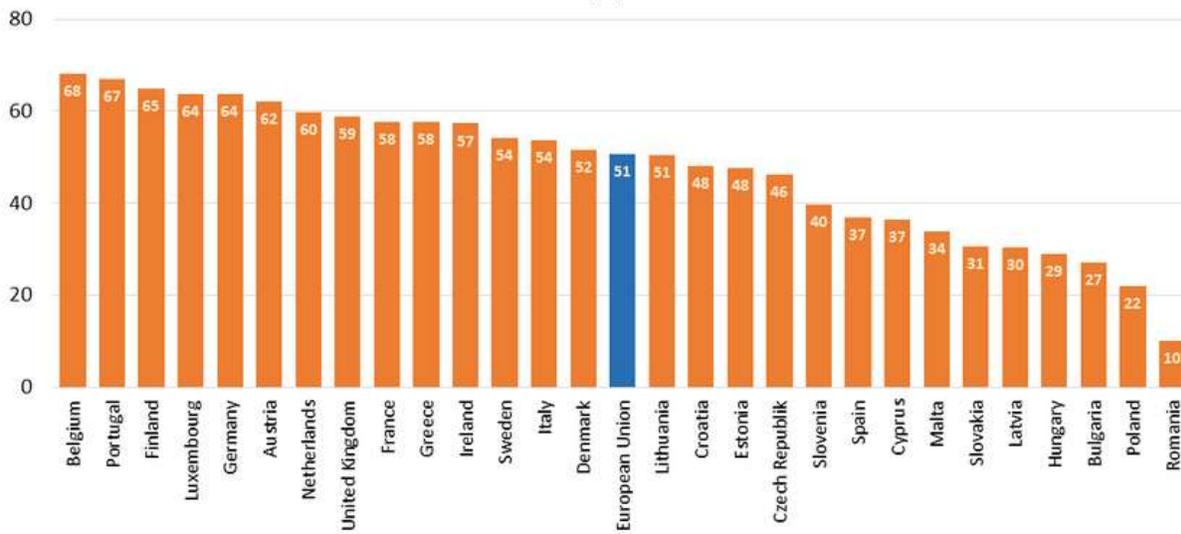


Figure no. 4 Share of innovative enterprises, 2016 (%)

Given that the Romanian economy is very well represented by the sector of small and medium-sized enterprises, which have a significant share in the totality of the companies active on the internal market [6], the fact that SMEs are not innovation-

oriented decreases the country's level of competitiveness globally and does not help create an environment favorable to the development of a sustainable society.

3. CONCLUSIONS

Sustainable development is a real challenge for all countries of the world and is the solution to poverty, human development and environmental protection. To ensure a sustainable future, all countries of the world must work to implement the Agenda 2030,

with the 17 United Nations Sustainable Development Goals. It seems that the fulfillment of the objectives is quite difficult, considering the current difficult geopolitical context and the

uncertainties and risks of economic, technological, social and ecological nature.

Evolutions will be influenced by socio-economic development methods and techniques. In order to transition to a sustainable society, an attempt must be made to ensure a balance between the economic, ecological, social aspects and the elements of the natural environment. Attention must be paid to long-term economic growth, to educate the civic sense among the population, to improve the education and health system, to reduce inequalities between men and women, between urban and rural areas, and last but not least, to raise awareness of the importance of the environment that has an impact on both human health and economy. Also, in order to save the planet, a fair economy and the well-being of its citizens, the new global competition must be characterized by global collaboration. There will be a period of unprecedented technological development, artificial intelligence, and the countries that will be the most innovative will be able to ensure better living conditions and

better social protection, in other words a sustainable environment.

According to European Innovation Scoreboard 2019, the performance of innovation varies greatly in the member states and led to their classification into 4 groups: Innovation Leaders, Strong Innovators, Moderate Innovators, Modest Innovators. Romania has the weakest performances, and the biggest problem is that the gaps are deepening in certain areas. The situation seems to be caused by the very low level of spending on research-development-innovation. Small and medium enterprises represent a large share in all Romanian enterprises and are not enough innovative. Although the main blocking factor seems to be the lack of necessary financial resources, Romanian companies must use all existing financing programs. Entrepreneurship also directly influences innovation, competitiveness and sustainable economic growth, and therefore one of the efforts that Romania must make is to focus on socio-economic development policies and on encouraging entrepreneurship.

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