

COMPARATIVE STUDY REGARDING RESEARCH AND INNOVATION IN ROMANIA AND OTHER EU MEMBER STATES

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***Abstract:** Investments in research and innovation means investments both in the future of Romania in particular and in the future of Europe in general. These investments improve the lives of millions of people in Europe and around the world by solving major problems of society. [1] EU support for research and innovation encourages cooperation between teams of researchers from various countries, ultimately leading to revolutionary discoveries. Unfortunately, Romania continues to be in 2020 on the last place in Europe in terms of innovation, from 2011 until now the performance of our country in this field being below 50% of the European average. Our country must promote open innovation with other European countries, especially in sectors such as the number of PhD students with completed studies, venture capital expenditures, marketing of new innovations in the market and entrepreneurship based on the opportunity, where in recent years there have been major declines. [10]*

Key words: research, innovation, entrepreneurship, investment, cooperation, marketing

INTRODUCTION

Europe's economic growth in recent decades has been largely driven by research and innovation, and investment in these areas is expected to generate more than 100,000 jobs in 2021-2027. Europe's population is only 7% of the world's population, but 20% of the world's investment in research and innovation takes place here. The innovation index in Romania is 31.4%. On the last place in Europe it is far ahead of countries such as Bulgaria (44.8%), Hungary (63.4%) or Lithuania (74.5%). Romania and Slovenia are the only EU states that register a major decline in the period 2011-2019 for all component development regions. Romania also has a Ministry of Research and Innovation, but for this field the GDP allocations are very low of only 0.3-0.5%. [11] In order to overcome this disgraceful status, greater resources must be allocated from GDP in the field of research - development-innovation, the cooperation and adaptation of open innovation with other European countries being the only way out of the current situation. A first step would be innovation at the level of SMEs, investment in research by companies but also human resources involved in innovation where the situation compared to the rest of Europe is much lower. [2] Romania needs to work with all EU member states, both in the field of research, development and innovation where it is in a better position, and in the field where there are major gaps. Investments in both research and innovation lead to the improvement of people's daily lives by solving some of the serious problems facing society.

MATERIALS AND METHODS

The methods used by us in this paper are those of analysis and comparison, carrying out with their help a comparative study on research and innovation in Romania and in other member states of the European Union.

RESEARCH RESULTS

EU countries, after the scores obtained it falls in terms of innovation in four performance groups, namely innovation leaders, strong innovators, moderate innovators

and modest innovators. The Nordic countries are leaders in recent years in this field, while Romania and Slovenia have registered the weakest performances. [7]

Globally, the EU has overtaken the US, but China has a remarkable growth in the field, as well as Japan and South Korea. [8]

Denmark has the best results in human resources and environmental innovation, Luxembourg for attractive research systems, Germany for business investment, Austria for building links, Malta for intellectual capital and Ireland for its impact on employment and sales. [7]

In the globalized world in which we live, it is urgently necessary for a better competitiveness to acquire knowledge and apply them in society. Technology transfer at national, European and global levels, both directly and through products and services, has gained great value in recent decades. [3]

Allocating more resources for research-development-innovation is the basic condition for one state to have competitive advantages over another. [15]

In recent years, EU, US and Asian countries have accounted for about 92% of total spending on research and development and innovation. There is an organic link between competitiveness and innovation, even if some economists dispute this.

We believe that the opening of research collaboration with non –E.U. countries such as China, United States or Japan, would offer Romania new possibilities to assert it self in the field.

A little historical analysis of the performance of the EU and the Member States in terms of innovation shows that in the period 2006-2013 the average annual growth rate of the Union as a whole was 1.7%, the officials in the field considering this as unsatisfactory.

In 2011-2012 the performance of innovative leaders (Germany, Sweden, Denmark and Finland) was 20% higher than the EU 27 average and that of second innovators (Luxembourg, the Netherlands, Belgium, the United Kingdom, Ireland, Austria, France), Slovenia, Estonia and Cyprus) was less than 20% higher than the EU27 average. [14]

During this period 2006-2013, most Member States and the EU as a whole improved their innovation performance. Portugal, Estonia and Lithuania had the highest growth in the field, while Sweden, Great Britain and Croatia registered the lowest rates, Romania registered some increases in the ranking in 2013. [13]

The process of convergence in research and innovation began to strengthen in 2011 but the widening of differences between EU Member States after this year was again visible.

The overall performance of innovation leaders is the result of a balanced national research-development-innovation system. Europe's innovative leaders have the smallest variations in performance in all dimensions and in all innovation outcomes. [9]

The EU is the most open space for research and innovation in the world. The EU works closely with international partners on joint programs.

Since 2012, the EU's innovation performance has increased by around 8.8%. The best performances during this period were in:

- ❖ Lithuania,
- ❖ Malta,
- ❖ Latvia,
- ❖ Portugal
- ❖ Greece.

Romania at the level of 2020 as well as in 2019 is included in the last performance group (modest innovators) occupying the last place in the EU.

Romania stands at 31.6% of the average value of the indicator calculated for the EU, last year had decreased to 34.4%.

Broadband internet penetration rate and exports of medium and high-tech products are the only indicators that Romania is approaching the average performance in the EU. Very low scores register our country for lifelong learning, SMEs with innovations in marketing, SMEs with product and process innovations and SMEs innovating in-house,

Romania's performance is zero for these indicators, the lowest from the EU.

Also in 2020, Sweden is the leader in innovation, followed by Finland, Denmark and the Netherlands. The UK's withdrawal from the EU has had a negative impact on the EU's innovative average performance

Through the mentioned strategy of Research, Development and Innovation 2014-2020, the level of competitiveness in this field of Romania must be clearly higher. Unfortunately, analyzing the indicators presented above, this did not happen in the case of Romania due to some disturbing factors both internally and externally. [5]

The National Research-Development and Innovation Strategy is generally based on three main pillars, namely:



Other general objectives regarding the development strategy 2020 and further 2021-2027 are:

- ✚ increasing the competitiveness of the Romanian economy through innovation here supporting the transition from cost-based to innovation-based competitiveness,
- ✚ increasing the Romanian contribution to the progress of frontier knowledge in the sense of growth the international visibility of research and experimental development in Romania
- ✚ increasing role of science in society, becoming relevant when the effects of development are felt in the daily lives of citizens.

Romania spends on average 10-14 times less than the EU average for research and development.

Our research-development-innovation system is underfunded, so Romania has been at the end of the EU ranking for ten 10 years.

The highest share of research working abroad is held by Romania.

Qualified staff is deficient in information and communication technology, health professionals, teachers, engineering, transport, distribution and people qualified in various trades.



Figure 1. The specific objectives regarding the development strategy 2020 and further 2021-2027

In our opinion the bureaucracy in Romania, in the field of research and innovation must be greatly reduced.

Research and innovation in Romania is characterized by excessive bureaucracy, frequent legislative changes, lack of human resources.

The poor performance in this sector is also due to frequent political changes, with the responsibility of the line ministry being quickly transferred from one minister to another. [16]

Our opinion is that a stable ministry of research and innovation should be set up over time to solve in a simplistic way all the problems related to this field.

In Romania there is a low degree of collaboration between the public and private scientific sectors as well as a low degree of commercialization of research results.

The number of people with doctoral and postdoctoral studies working in research and development remains extremely low in our country.

In the future, the biggest challenge for Romania in particular and for the EU in general is the much more strategic approach to innovation.

Innovation must be the primary policy objective where all instruments, measures and funding are designed to contribute to innovation. [12]

EU policies globally and national and regional policies are mutually reinforcing.

The EU and the Member States must continue investing in education, research, development and innovation, and that investment must not be affected by budget cuts, as additional funding is needed.

Education systems need to be modernized at all levels. Researchers and innovators need to work together across the EU as well as at national level. [6]

Access to EU programs needs to be simplified, private sector investment needs to be stepped up.

In Romania, research must produce more innovations, cooperation between the world of science and enterprises must be intensified.

We think is that in order to close the gap between us and the other European States in the field of research it is urgently necessary to establish partnerships and promote an innovation as open as possible.

European innovation partnerships need to be launched in order to accelerate the development and market development of innovations in order to pool expertise and resources as well as boost the competitiveness of EU industry.

Social innovation must be perpetuated. In the public sector, innovation needs to be better understood, successful initiatives in this sector need to be stimulated.

It is necessary to work as well as possible with European partners, in order to collaborate with all countries, both EU and non-EU.

Romanian and EU entrepreneurs who come up with new ideas on the market need to be encouraged and better funded. [4]

Intellectual property rights need to be more accessible.

In the field of innovation, Europe starts from a position of strength. Many Member States are world leaders in production, creativity, design, energy, environmental technologies. Some regions in Europe are among the most innovative in the world.

However, Europe allocates much smaller resources than the US and Japan to research and innovation. There is too much independence at national level for national and regional research and innovation systems. The creation of a true European Research Area can enhance Europe's potential for major progress by increasing the effectiveness of investments needed to bring ideas to market.

The EU encourages cooperation between the various research teams, between SMEs by promoting open innovation in the same field and creating real business incubators at the level of research and development to which all Member States have access.

Allocating large resources to the research-development-innovation sector makes one state have major competitive advantages over others.

Convergence from the field of research and innovation has strengthened since 2011 but unfortunately after this year the differences between Member States have increased again at present, these differences becoming more pronounced.

In the globalized world it is necessary to be as competitive as possible the acquisition of various knowledge as well as the application of this knowledge for the good of society.

Innovative leaders in Europe do not see changes in performance in the field of research-development-innovation contributing to good and very good results at all economic levels.

In our opinion the migration of qualified research staff must be stopped by offering internal facilities.

CONCLUSIONS

Investment in research and development and innovation has led to Europe's economic growth in recent decades, creating new jobs, although Europe's population is only 7% of the world's population. 20% of the world's investment in research and development is growing here.

In recent years, the EU, the US and Asia have accounted for about 92% of total spending on research and development and innovation.

The best results in the EU in this field have been in the Nordic countries in recent years, while Romania and Slovenia have the worst results.

The EU is the most open space for research and innovation in the world, working closely with international partners on various joint projects.

From 2012 to 2020, the largest increases in innovation performance were in Lithuania, Malta, Latvia, Portugal and Greece.

In 2020, Sweden appears to be the leader in innovation, followed by Finland, Denmark and the Netherlands. The UK's withdrawal from the EU has had and is having a negative impact on the EU's innovative average performance

The innovation index in Romania is 31.4% on the last place in Europe, being surpassed by other countries such as Bulgaria, Hungary and Lithuania.

Although Romania has a Minister of Research and Development, GDP allocations are very low, by only 0.3-0.5%.

Both in 2019 and this year's results place Romania among the modest innovators occupying the last place in the EU.

To overcome this situation, Romania must promote open innovation with other European countries to collaborate with teams of researchers both in the EU and around the world, to use joint projects to intensify the commercialization of new innovations on the market, to promote entrepreneurship based on opportunity. No, lastly, GDP allocations for the research-development-innovation sector need to be substantially higher.

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