Analysis of Romania's Performance in the Implementation of European Strategies for Innovation and Competitiveness at Country Level

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Abstract

The European economy has been strongly tested by the effects of the economic crisis in 2008, so economic policy makers had to identify tools to counteract them and identify innovative strategies meant to support economic recovery in the shortest possible time. Considering the complex character of the economies that form the European Union, and their various needs, the innovative character of the identified strategies represented the determining factor of ensuring competitiveness among them. The identification of the specific development needs of the national economies is the main condition for the programs started at community and national level to reach their objectives of economic competitiveness and innovation.

This paper aims to analyse the economic competitiveness of Romania in the European context, aiming to identify how the premises of this concept are ensured by using the financial instruments made available by the European Union. The objective of this study is to establish competitiveness at regional level, which is particularly useful in guiding the financial support for the 2014-2020 multiannual financial framework.

The analysis of the competitiveness of the Romanian economy will take into account the Global Competitiveness Index and the Regional Competitiveness Index, following the way of relating the competitiveness and sustainability measured as economic dimension. The results of these evaluations will be the basis of the recommendations regarding the future efforts that Romania should make in order to successfully implement the competitiveness and innovation strategies promoted by the European Union. In this sense, the financial instruments used to support the competitiveness policy are an essential condition of innovation and they are the basis of the premise of sustainability of the Romanian economy.

Keywords: Competitiveness; strategy; innovation; financial instruments;

JEL Classification: F15; F43; O11;

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1. Introduction

The project of building a united Europe in diversity and prosperity has proved bold and challenging since its inception. If the idea of accepting cultural diversity as a key element in building a united Europe was accompanied by the consent of all states that wanted to carry out this project, achieving common prosperity has put pressure on some lagging states in terms of economic development.

In order to reduce or eliminate the gaps in economic and social development, a series of strategies have been outlined to identify the means and tools needed to implement the steps required to achieve the objectives set by them. The adoption of development and

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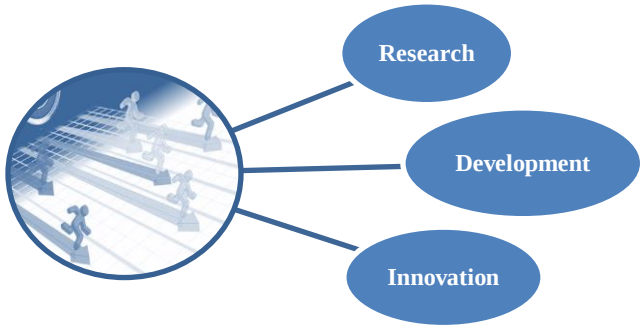
economic and social cooperation strategies took into account the structural particularities of the states that joined this union, pursuing objectives aimed at ensuring sustainable individual and collective development based on competitiveness and innovation.

One of the most complex strategies that has considered the issue of competitiveness is the Lisbon Agenda, with the central objective of coordinating national policies to ensure an increasingly integrated economic space. The development gaps of the countries that make up the European Union have been the main cause of the delay in the formation of a homogeneous and internationally competitive economic space. Thus, the Lisbon Agenda, such as the Europe 2020 Strategy, was completed and followed by another set of strategies aimed at solving the problem of development disparities at national level. One of the main purposes of Europe 2020 Strategy is to ensure "*the most competitive economies and most dynamic economies of the world based on knowledge, capable of sustainable development, offering higher quality jobs and higher level of social cohesion*" (Balcerzak, 2016; Banociova and Martinkova, 2017).

The objectives' substantiation of these strategies took into account the main elements that stood in the way of ensuring a competitive climate at national level (Simuț, 2016), meaning the disruptive factors that made it difficult to establish a balance between aggregate demand and supply at national level. Considering the model of the European states that stood out as performance and competitiveness, it was identified that the engine of ensuring sustainable development and ensuring internal and external competitiveness is represented by the trinomial research-development-innovation (*Figure 1*).

Figure 1. The trinomial of ensuring competitiveness



Data source: Author's conceptualisation

Although the results of the implementation of the Lisbon Agenda 2010 were not as expected, the Europe 2020 Strategy did not reduce its ambitions for the goals it set for economic development in the last decade. The positive pressure on Member States has been translated into the assumption and adoption of national competitiveness strategies in which each state has pursued the objectives set considering the structural features and economic and social blockages that characterize it.

The main strength of current competitiveness strategies is the reorientation of research-development-innovation on current challenges: efficient use of resources, health, and demographic change, improving the innovative framework of companies and ensuring a competitive economic environment focused on the circular economy.

Given the current context and international economic developments, it is confirmed that ensuring competitiveness is no longer an objective, but a condition for ensuring a place in the emerging economic system and the main pillar of competitiveness is innovation. From

the perspective of competitiveness and innovation as a pillar of its security, Romania's position is far from satisfactory. Although there are steps taken in this direction, the analysis of the results obtained places Romania on the lower positions in such a ranking.

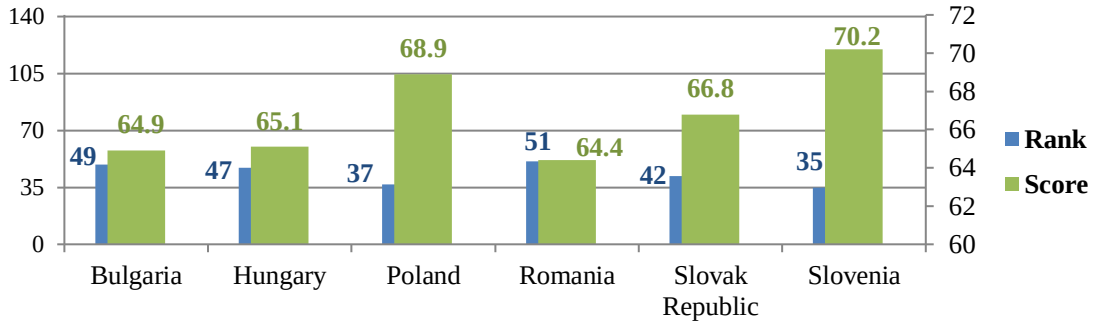
2. International and National Competitiveness Analysis

2.1. International Competitiveness

The theoretical concept of competitiveness has been widely debated, knowing over time many definitions and approaches. Some theorists and researchers characterized competitiveness as being the result of improving six efficiency pillars: higher education and training, goods markets, labour markets, financial markets, technological readiness, and market size (Sala-i-Martin *et al.*, 2015). In the current global economic landscape, distinct evolutions and trends of advanced and emerging economies can be observed, especially in terms of competitiveness and economic growth. The economies of emerging and developing states, such as Romania, are becoming increasingly important globally through the resources held.

The annual competitiveness reports prepared by the World Economic Forum for more than three decades study and analyse comparatively the determinants for the competitiveness of global economies. Since 2005, the World Economic Forum has based its analyses on the Global Competitiveness Index (GCI), which is a complex tool for measuring the fundamental micro or macroeconomic components of national competitiveness. Romania's place on the global map of competitiveness is modest according to the results of the latest comparative evaluations. Although it slightly improved its overall competitiveness index calculated in 2019 compared to the previous year, Romania ranks 51st out of the 141 countries evaluated, ranking considerably behind Bulgaria (49), Hungary (47), Poland (37), Slovakia (42) and Slovenia (35), (*Figure 2*). Thus, Romania remains in the echelon of uncompetitive economies at international level.

Figure 2. Competitiveness Performance Overview in 2019

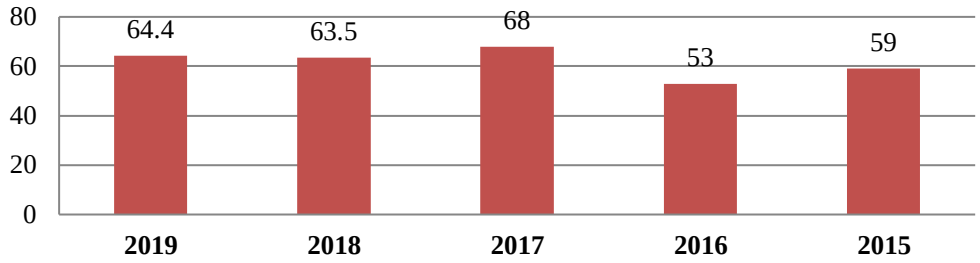


Data source: Global Competitiveness Report 2019, www.weforum.org

Therefore, even if the rates of economic growth in recent years have brought in 2019 the rise by 1 position in the world ranking of the global competitiveness index, and the score obtained in the last 5 years is slightly increasing (*Figure 3*), Romania must recover historical gaps in the competitiveness of the international economy. The general level of productivity is the determining factor for the economic competitiveness and the degree of

prosperity that a country can achieve. In other words, the more competitive an economy is, the higher and more sustainable it has the potential for economic growth.

Figure 3. The Global Competitiveness Index for Romania in the period 2015-2019



Data source: Global Competitiveness Reports, www.weforum.org

The concept of competitiveness is very complex and involves a series of dynamic and static components that interact with each other. The global competitiveness index groups all the components identified into 12 main drivers of productivity, or 'pillars', grouped into 4 main pillars, as follows: Enabling Environment, Human Capital, Markets and Innovation Ecosystem.

The values calculated for Romania's competitiveness indices highlight an economic model supported more by ICT adoption (32nd place in the world ranking) than by the development of the financial system (86th place in the world ranking), health system (83rd place in the world ranking) or the innovation ecosystem in general. The table reflected by the values of the competitiveness indicators for Romania, for 2019 is presented in Table 1.

Table 1. Competitiveness indicators for Romania in the world ranking, 2019

	Index Component	Rank/141	Score
Enabling Environment			
1st pillar	Institutions	52	58.1
2nd pillar	Infrastructure	55	71.7
3rd pillar	ICT adoption	32	72
4th pillar	Macroeconomic stability	56	89.7
Human Capital			
5th pillar	Health	83	77.2
6th pillar	Skills	72	62.5
Markets			
7th pillar	Product market	64	55.4
8th pillar	Labour market	57	61.6
9th pillar	Financial system	86	57
10th pillar	Market size	41	65.2
Innovation Ecosystem			
11th pillar	Business dynamism	72	59.7
12th pillar	Innovation capability	55	42.3

Data source: Global Competitiveness Report 2019, www.weforum.org.

At the level of sub-indicators, it can be seen how the competitiveness of the Romanian economy is supported most on a large consumer market (41st place in the world ranking) and a quite favourable macroeconomic environment (56th in the world ranking). Even the Romanian institutions seem to have improved their quality, occupying the 52nd place worldwide, their quality greatly influencing the competitiveness and growth that support the process of economic development. The precarious level of the health system (83rd place in the world ranking), but also the unsatisfactory level in terms of financial system development (86th place in the world ranking) and the low degree of business dynamism (72nd place in the world ranking) negatively influence the economic performance of Romanian enterprises.

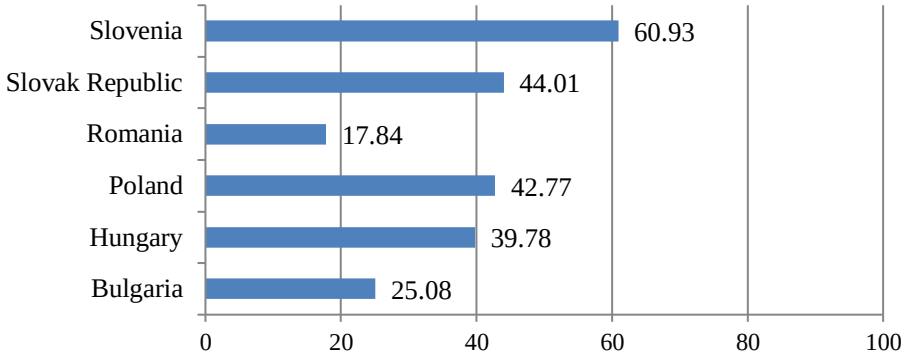
2.2. National Competitiveness

The overall competitiveness of a country is directly influenced by competitiveness at regional and territorial level. The role of local governments is essential, and many competitiveness factors are determined by their governance. The responsibility for sustainability factors of national competitiveness rests largely on the political component of society (Gîrneaţă and Dobrin, 2015). It was observed that there are larger gaps in competitiveness at regional level than between countries, which determined the European Commission to develop the Regional Competitiveness Index (RCI) for Europe, starting with 2010.

RCI highlights the strengths and weaknesses of each EU region. The results of these evaluations are particularly useful in targeting financial support for regional development to one region or another. The 2014-2020 financial programming of the funds (€ 325 billion) allocated through the EU's Cohesion Policy aimed to eliminate development disparities through investment in job creation, growth, improving the quality of life and sustainable development. Romania has been allocated approximately 23 billion Euros from cohesion policy funds (10% more than in 2007-2013).

In Romania there are large development disparities between the capital and the other regions. Although analysing the global competitiveness index (GCI), Bulgaria, Hungary, Poland, Slovakia, and Slovenia occupy better positions than Romania, they also present regions with a low level of competitiveness. In 2019, Bulgaria, with the Severozapaden region and Romania, with the South-East region, are in the bottom 10 regions, with the lowest level of competitiveness in the EU. It should be mentioned that these countries have not been able to get out of this position for over 10 years. According to RCI 2019 Romania presents the lowest level of regional competitiveness in the comparative analysis with the 5 neighbouring states, as can be seen in the figure below (*Figure 4*). At national level, ways to reduce these disparities need to be considered, a strong lever being the European cohesion funds.

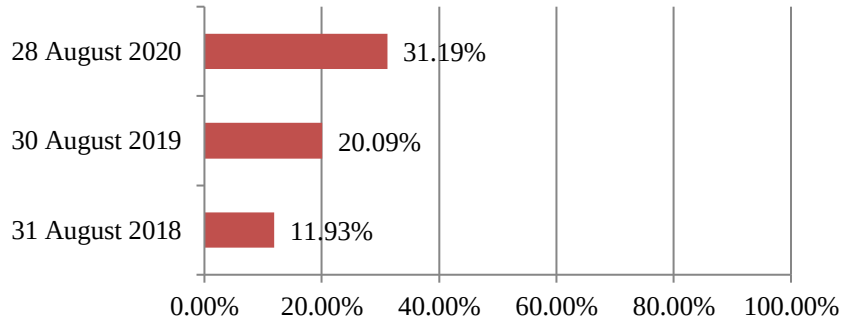
Figure 4. The Regional Competitiveness Index 2019 by country level



Data source: European Commission, https://cohesiondata.ec.europa.eu/

Romania's economic competitiveness is currently supported by the Competitiveness Operational Program (POC), one of the strategic programs for cohesion policy, according to the Europe 2020 Strategy objectives. POC supports investments in strengthening research, technological development, and innovation (RDI) and underdeveloped ICT infrastructure. The total budget for the operational program was set at EUR 1.329.787.234 and the absorption rate on 28 August 2020 was 31.19% (European Commission, 2020). The opportunities offered by European funding in the field of competitiveness have not been properly exploited as shown by the low values of their absorption rate for the 2014-2020 financial programming (*Figure 5*). Highlighting the results that Romania has registered in the field of absorption of these funds is relevant from the perspective of the causes that prevented this process (Ranf and Gorski, 2020). The lack of a coherent vision on the perspectives and objectives of ensuring competitiveness, the relatively low level of training of staff involved in accessing European funds and the lack of adequate research and development infrastructure were the main shortcomings in increasing national performance in terms of competitiveness.

Figure 5. Effective absorption rate for Romania for Competitiveness Operational Program (POC)



Data source: www.fonduri-ue.ro

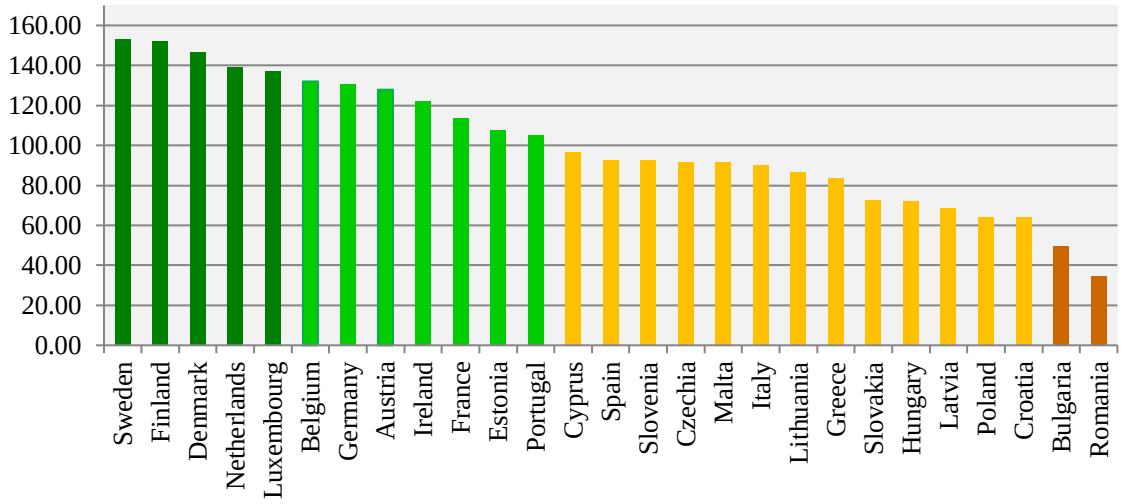
Although this is a low absorption rate, it must be borne in mind that this program runs projects that require a large number of resources and are usually cumbersome in progress, due to the procedures they have to follow.

3. Innovation Analysis as a Determinant of Competitiveness

A country's innovative capacity depends on a set of factors whose contribution is more significant as they converge in the same direction. Given the importance of innovation, this has been one of the major objectives of European strategies aimed at competitiveness and increasing economic and social cohesion at Union level. The premise that *"the more a country is on the technological frontier, the greater the ability to absorb innovations*" (Olteanu, 2006) determines opportunities that may be punctually valued at local or regional level with a great impact on economic development.

In order to evaluate and measure the innovative capacity of European states, the European Commission annually analyses the performance of countries by referring to a set of indicators that are found under the name of European Innovation Scoreboard (EIS). The role of this EIS is to present a comparative analysis of the research and innovation performance of EU Member States. The value of the general innovation index of a state is established based on the analysed indicators.

Figure 6. The innovation index in the European Union in 2019



Data source: Eurostat - www.ec.europa.eu

In *Figure 6*, Member States are classified into four major performance groups based on the results of the innovation index, as follows:

- Innovation Leader (dark green);
- Strong Innovator (light green);
- Moderate Innovator (orange);
- Modest Innovator (brown).

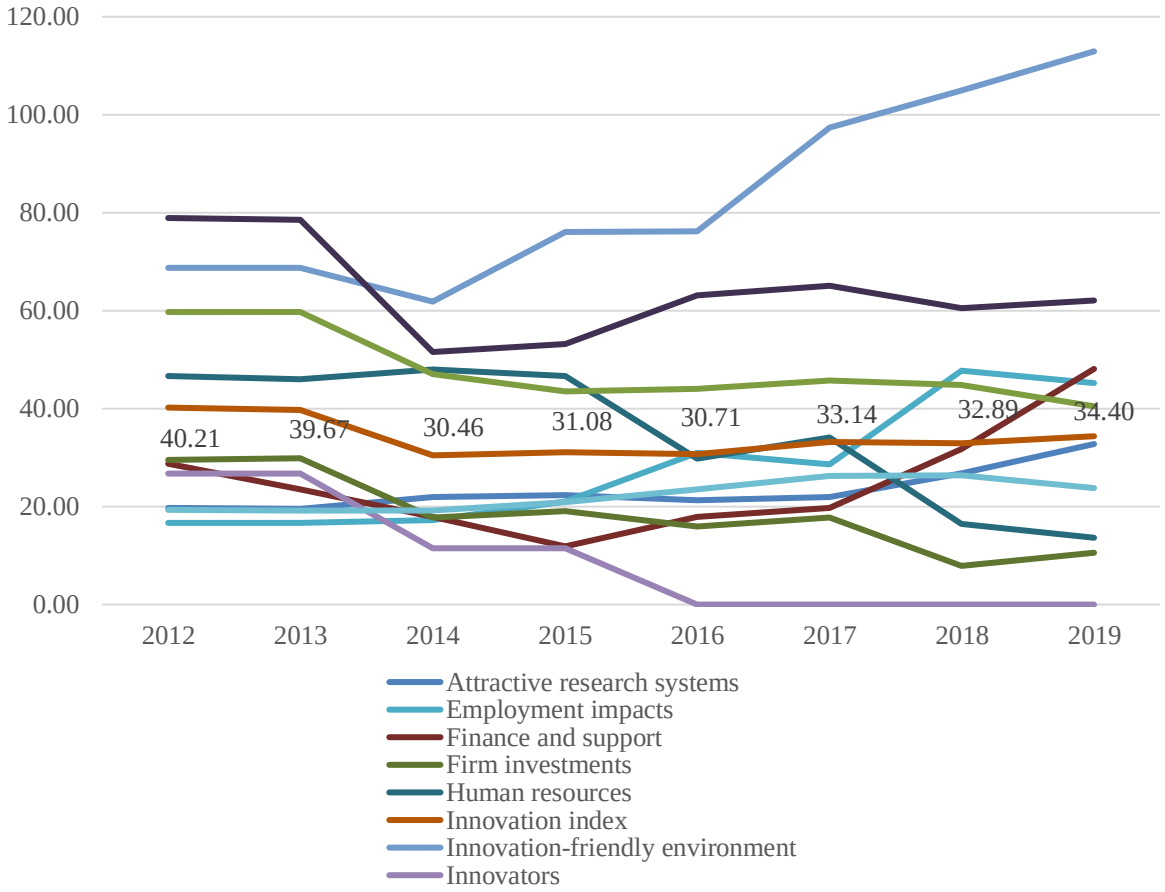
Romania's position on innovative capacity in the European context is also captured in *Figure 6*. Comparative analyses in terms of innovation in the European context place Romania at the bottom of the ranking. This position is not at all satisfactory and highlights a number of problems and vulnerabilities of the national research-innovation system. Romania is part of the Modest Innovator category, its performance in the field of innovation having a slightly downward trend in recent years. 2012 was the year with the

most notable performance, followed by a period when the values of the innovation index have decreased, being much lower than the EU average.

The determination of the innovation index is based on a set of indicators that fall into nine categories targeting the main pillars of innovation. In Romania, in order to better capture the structural differences that determined these developments, we presented the evolution of the main indicators described in the annual European table on innovation for the period 2012-2019.

As can be seen from *Figure 7*, the most representative pillars of the innovative dimension in Romania are represented by Innovation-friendly environment and Sales impact. The weakest results of the innovation process are reported among firm investment, human resources, and innovators.

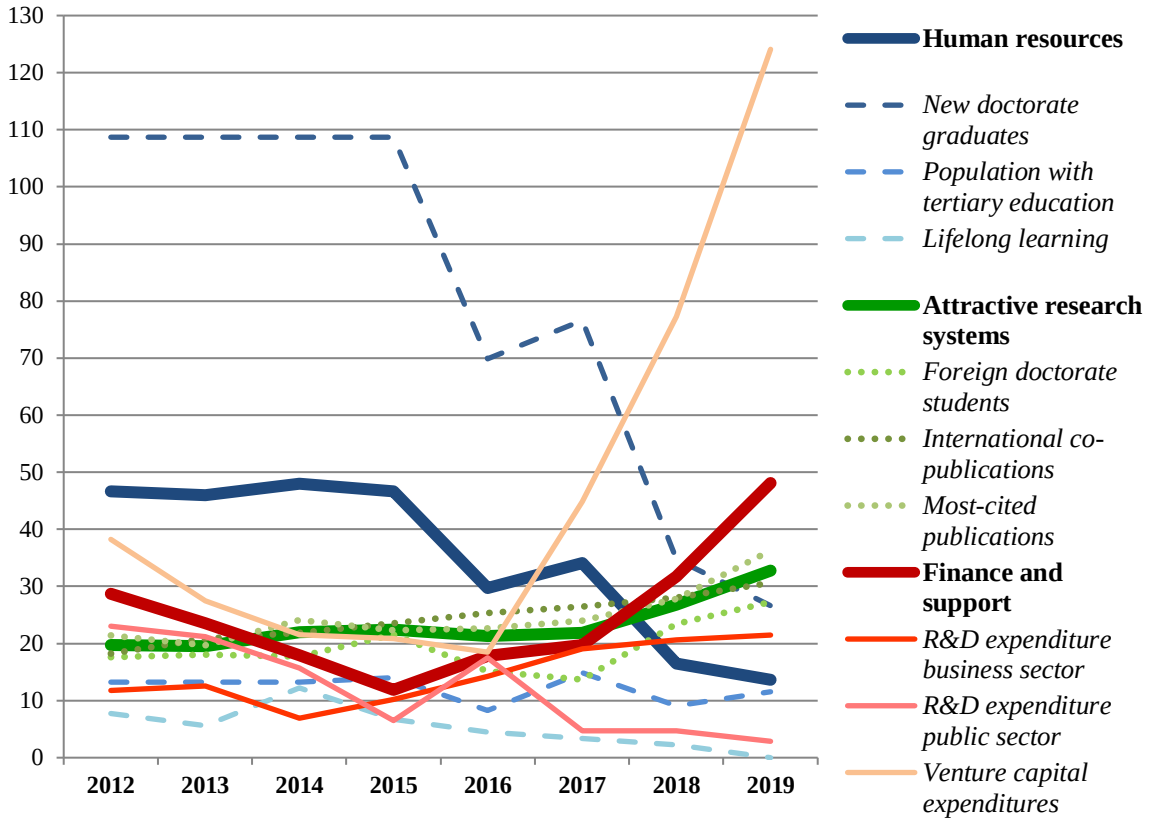
Figure 7. The evolution of the main indicators of the European Innovation Scoreboard for Romania (2012-2019)



Data source: Eurostat - www.ec.europa.eu

The main drivers for performance in innovation cover three particularly important dimensions, namely: human resources, finance and support and attractive research systems. They represent the promoters of performance in terms of innovation and ensure the framework conditions for its manifestation. The main resources involved in these pillars are human and financial resources, which are the key elements on which innovation is based. Analysing these pillars in detail, we can identify some vulnerabilities and weaknesses of the Romanian innovation system (*Figure 8*).

Figure 8. The evolution of the indicators that compose the potentiating indices of innovation for Romania (2012-2019)



Data source: Eurostat - www.ec.europa.eu

Referring to human resources, there is a deterioration of this indicator in the period under review, due to a significant decrease in research concerns in the field of doctoral studies, which translates into a decrease in the number of potential researchers who could have contributed to the field of research-innovation. The evolution of individuals' concern for lifelong learning is also unfavourable, which will have a negative impact on increasing innovation performance.

Although it is not possible to speak of a significant favourable evolution, the attractiveness of the research system continues to have an increasing trend, based on the scientific research activity measured by publishing articles and attracting an increasing number of foreign doctoral students.

Investments in research and development, both in the private and public sector are an essential component in developing the infrastructure of innovation processes. The financial support in this field registered an ascending trend starting with 2016, largely due to the increase of venture capital expenditures that reached in 2019 a value approximately 5 times higher than in 2016. What attracts attention in an unpleasant way is the decrease of the public sector's concern for research and development, the lack of vision and coherence in the application of public policies in this field, being one of the main vulnerabilities of the Romanian government system. This reality is also confirmed by the very low share of R&D expenditures in GDP, which is well below the 3% of GDP target set in the Europe 2020 Strategy (Barta *et al*., 2013) (see *Table 2*).

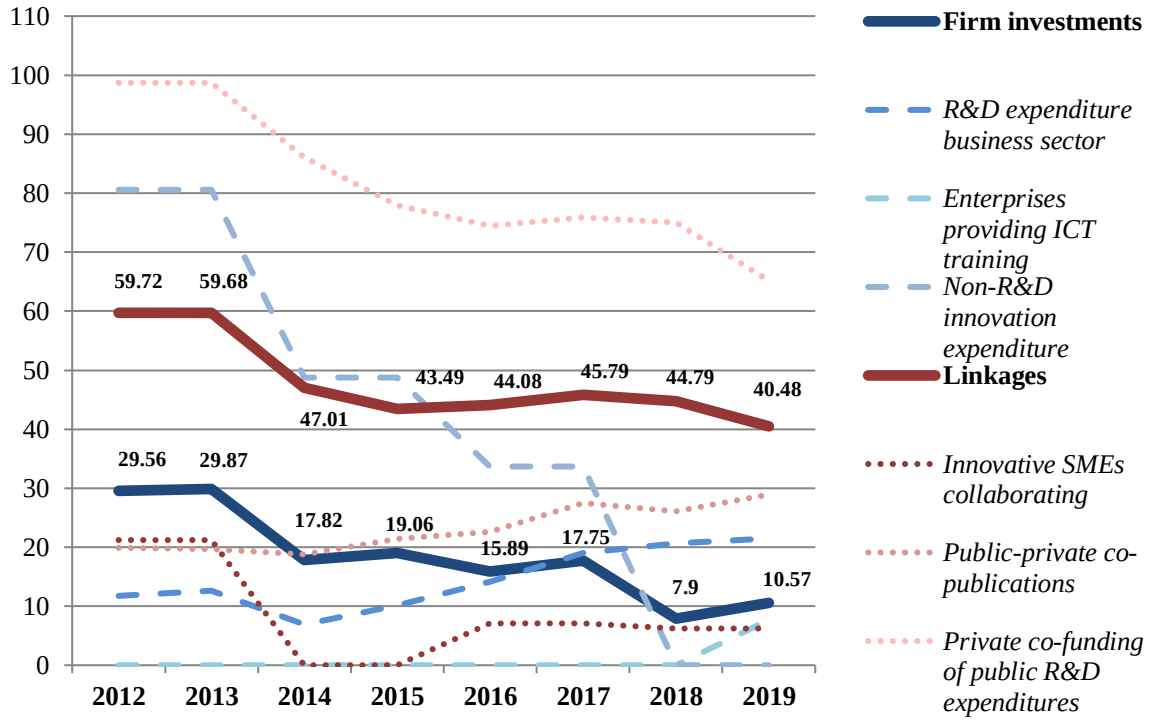
Table 2. R&D expenditure in Romania as GDP percentage

	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	0.5	0.51

Data source: National Institute of Statistics, www.insse.ro

Another important component of the innovation process is the company-level activities that describe the openness and capacity they have in terms of innovation and include four categories of innovation indicators: Firm investments, Linkages, Innovators, and Innovation-friendly environment (*Figure 9*). Since 2012, the most significant progress has been made in areas such as Innovation-friendly environment, especially due to broadband penetration, and in Firm investment due to the increase in R&D expenditure business sector and companies offering training in the field of ICT since 2018. A number of dysfunctions can be reported among the indicators that measure collaborations and partnerships between the public and private sectors, where the lack of a common vision and strategies towards innovation seems to be the main factor in achieving notable performance in this field.

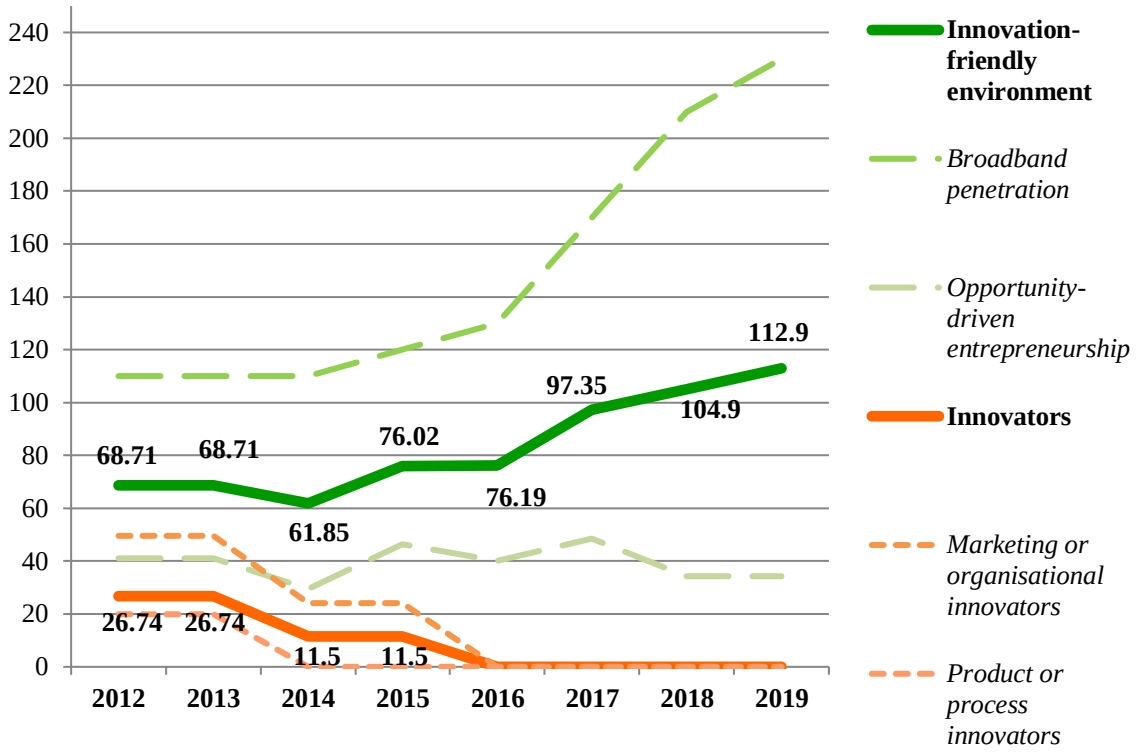
Figure 9. The evolution of the indicators that measure the innovation activity for Romania (2012-2019)



Data source: Eurostat - www.ec.europa.eu

The precarious situation of the innovation activity is largely due to the weak participation in collaboration networks and entrepreneurship, which highlights the lack of specialized and trained human resources to participate and support with know-how these projects. During the analysed period, in the Innovation-friendly environment can be observed a significant and constant improvement, the values of this indicator registering an increase of approximately 39% in 2019 compared to 2012 (*Figure 10*). The main factor that contributed to this evolution is Broadband penetration.

Figure 10. The evolution of the indicators that measure the innovation activity for Romania (2012-2019)



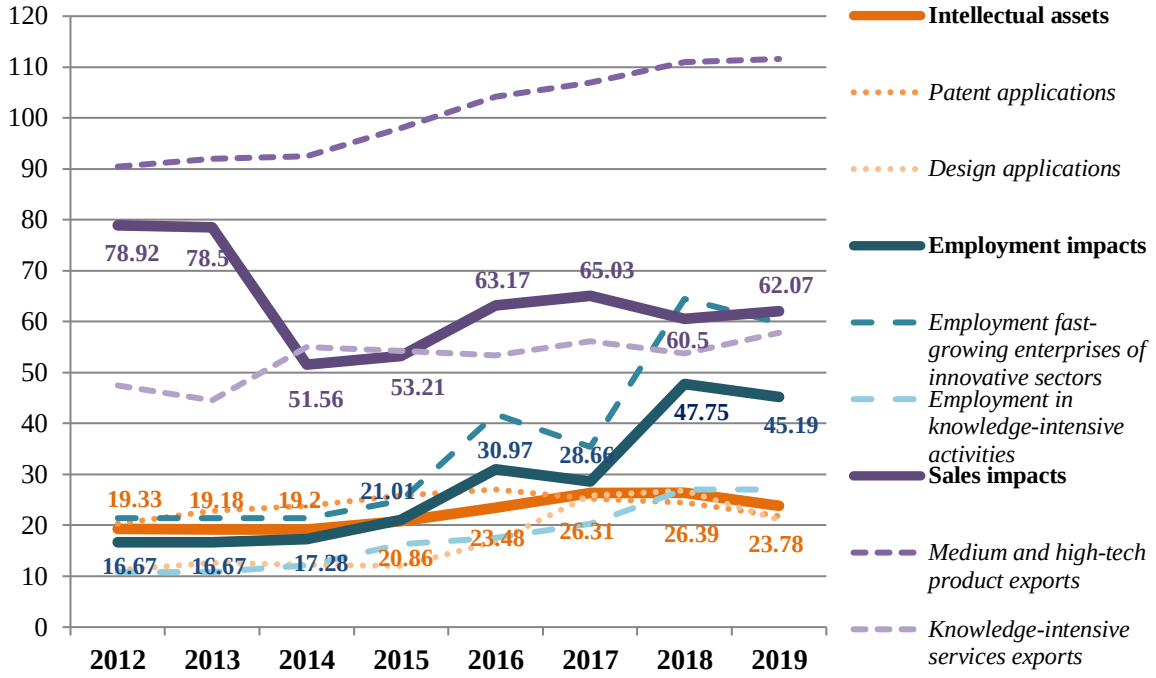
Data source: Eurostat - www.ec.europa.eu

Despite the significant increase of the Innovation-friendly environment, this context did not lead to the materialization of new innovative products or processes or to the intensification of some activities targeting the area of Marketing or organizational innovators. This aspect can also be correlated with the evolutions of the firm investments' indicator and of the sub-indicators that compose it, which highlights a decrease of the interest at company level to finance and market innovative products or to provide ICT training.

A recent study (Bătușaru, 2019) which presents the evolutions of small and medium-sized companies in Romania over the last decade, shows that the share of companies carrying out professional, scientific, and technical activities is about 11% of the total SME operating nationally. Of these, only a share of 30.8% were innovative in the first part of the analysed period, following that starting with 2016 the results of their activity can no longer be quantified.

The results of innovation at country level are reflected through 3 sets of indicators, namely: Intellectual assets, Employment impacts and Sales impacts. They aim to quantify the economic and social effects of the innovation process (*Figure 11*).

Figure 11. The evolution of the indicators that measure the innovation activity results for Romania (2012-2019)



Data source: Eurostat - www.ec.europa.eu

The results of the innovation activity from the perspective of Intellectual Assets are modest, marked by an insignificant evolution of patent and design applications, so that the innovative impact of patented products and services does not highlight Romania among European countries. At the level of the impact on the economic and social component, an increasing trend is highlighted in the analysed period. Increasing the number of employees among companies, carrying out research and innovation activities, is a strong point and further efforts need to be made to support, shape, and finance the human resources operating in innovative sectors. The lack of highly qualified national specialists, as well as the need to step up efforts to improve education for research, development, and innovation, are a reality that is also encountered in other European countries such as Slovakia (Dobrovic *et al.*, 2018) which further accentuates the importance of joint competitiveness and innovation strategies at European level.

With a modest evolution compared to the reference period, Sales impact is notable for the upward trend recorded by the export of medium and high-tech products, which also led to a significant increase in profits from licenses and patents abroad. The experience of European countries with advanced economies in terms of competitiveness and innovation shows that the services sector has become more "tradable" as it has a higher value in the share of international trade of advanced economies (Landesmann and Leitner, 2015, p.3), which puts even more pressure on the gaps in the field of innovation that Romania will have to recover.

However, Romania does not excel in this field and the analysis highlighted structural dysfunctions that have hampered competitiveness in terms of innovation. The main causes that led to these results are largely represented by the large development disparities between Romania and the group of innovation leaders. In addition, the trend is to widen the disparities rather than the convergence of innovation expected in the EU by the 2020s. The identification of the factors that determine the blocking of innovative activities is essential for understanding the innovation process and for formulating an

innovation policy, subordinated to the criteria of increasing national and international competitiveness.

4. Conclusions

According to the analysis of the global competitiveness index, Romania has made progress in the last 20 years, but it is still insufficient to keep up with other EU Member States, and its position on the global competitiveness map is modest.

In the direction of increasing the competitiveness of the national economy and the positive contribution to the EU competitiveness of which Romania is a part, the efforts must be intensified both at governmental level, business environment and at the level of the whole society. In order to reduce the existing competitiveness gaps at regional level, must be encouraged the access to the current European cohesion funds, which will strengthen Romania's economic competitiveness worldwide and therefore its sustainable economic growth.

Innovation under all its components - technological and non-technological - involves a set of resources whose quality is particularly important. The existence and development of an innovation infrastructure as well as the proper training of human resources should be the goal of key coherent government policies based on well-founded innovation strategies. At the same time, labour market efficiency, financial or goods market efficiency and living standards can be improved through innovation processes.

Romania's performances in the field of innovation place Romania at the end of the ranking among European countries, results that highlight a series of structural deficiencies at national level that have hampered the capitalization of this pillar of competitiveness.

There is a need for better coordination of education, research and development systems and innovation efforts and more coherence in collaboration in science, technology, and innovation. Human resources are insufficiently motivated, fact proved by the downward trend of those who choose to pursue doctoral studies or the lack of concern about supporting and developing new knowledge throughout lifelong learning. The lack of close collaboration based on strong public-private partnerships is one of the main vulnerabilities of the innovation assurance system. Also, the funding allocated to research and development is very low due to the distribution of a very small percentage of GDP in the area of research and development expenditure, well below the 2% of GDP target set by the Europe 2020 Strategy and assumed by Romania through the Partnership Agreement. The funding instruments provided by the European Union through the funds allocated to the financing of Operational Programs aiming at competitiveness and regional development on the specific axes of research-innovation have not been properly capitalized either, the absorption rates being particularly low.

Although some indicators had favourable and even spectacular developments (such as broadband penetration, venture capital expenditures) in the reference period 2012-2019, their impact on the overall innovation index was not as significant as it appears from its evolution.

The existence of numerous disparities in economic and social development in the regions of Romania, the lack of a coherent vision and policy in the field of research and development, through which the objectives of European strategies to be translated into

viable projects at national level, have made Romania not record notable performances in this field, giving it the status of modest innovator.

It is found that innovation is one of the determining factors of competitiveness and must be analysed in correlation. Therefore, in order to be among the competitive states, we believe that Romania must succeed in correlating superior performance of competitiveness and innovation, at the same time with a qualification of human resources, encouragement of entrepreneurship, supported by efficient and transparent governance, focused on increasing the long-term well-being of citizens.

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Eurostat – European Commission: https://ec.europa.eu/eurostat.

European Funds- Romania: www.fonduri-ue.ro.

National Institute of Statistics: www.insse.ro.

World Economic Forum: www.weforum.org.