REGIONAL INNOVATION IN ROMANIA – THE CASE OF BUCHAREST-ILFOV REGION

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Abstract

Regional innovation systems are solid enablers to ensure economic growth and sustainability development across locations. The Regional Innovation Scoreboard (RIS) analyzes the innovation performance of European regions and proposes a set of indicators to measure the development of innovative endeavors across years. Using the data from the RIS for a period of seven years, between 2014 and 2021, the current paper evaluates the achievements of Romanian regions in terms of innovation. We have used a case study approach and selected the Bucharest-Ilfov region, the only Romanian region that overall scores as Moderate innovator. By adopting the benchmarking technique, we compare the performance of Bucharest-Ilfov region with the other seven Romanian regions in the attempt to understand how regional strengths can be applied for continuous progress. The findings suggest that an increased focus should be placed on local and regional public policies and governmental funding to increase collaboration between all entities involved in the innovation process and contribute to more innovative regions.

Key words: *benchmarking; competitive advantage; economic growth; regional innovation systems; public policy.*

JEL Classification: *F43, F61, L38, M21*

I.INTRODUCTION

One of the European Union's objectives was to develop a level of economic growth for the member states that could compare to other leader world economies. In this sense, there have been developed a series of initiatives that could support sustainable growth and positively affect the national economies of the member states (Harja, 2020). Lopes et al. (2021) agree that the regional policy across European member states has shifted so that it could ensure the development of innovation and sustainability and secure adjustment to local realities. Regions played an important role in addressing the gap and the changes that needed to be implemented to achieve the overall growth of the European Union. The Regional Innovation Scoreboard highlights the geographical differences as important factors in addressing the variations among regions. However, it should be noted the common understanding in terms of the innovation process, which is considered an evolutionary one and a result of the interactions between technology, production, policy and demand (Morisson & Doussineau, 2019). Ozen & Baycan (2022) affirm that regional innovation systems represent an important approach that explains the differences between regions and their various diversity regarding the innovation concept due to different infrastructures, expertise, funding, which in turn creates new opportunities for inter-regional cooperation. The authors define the regional innovation system as the relationship formed between the major stakeholders such as firms, universities and technology and research centers. Moreover, Lopes et al. (2021) agree that regional innovation systems are characterized by a series of elements, unique to each region, impactful for the relationships formed between institutions and other innovative networks.

Morisson & Doussineau (2019) describe the complexity of establishing common standards for European regions, a reason being the differences and particular contexts of each region. In this sense, Ozen & Baycan (2022) reveal that the country or region size is of considerable importance when assessing the innovation performance. In this sense, the European Union has adopted an approach that supports fostering regional policies to ensure regional development. Following this line of thought, the innovation process was highly stimulated in the attempt to balance social and economic disparities across European regions (Rentková, 2018). In addition, Harja (2020) reveals that the main strategies created focused on simplifying the funding conditions, thus positively influencing the access to European funds, enhancing the benefits provided to urban development, by placing cities at the forefront of the economic reform and implementing procedures to sustain local communities. Consequently, member states had to implement a set of good practices to foster the development of economy and entrepreneurship across regions. Another initiative highlighted by Lopes et al. (2018) is the concept of smart specialization. This includes the development of strategies and techniques that aim to increase the innovative capacities in the regions and instill economic growth at public institutions level. In addition, another major focus was placed on investments, thus directing the efforts towards smart specialization regions over a period of several years with the objective to create a more sustainable and inclusive growth. In order to achieve the „desired

economic performance" regions should implement different processes and resources, the best approach being a holistic one (Lopes et al., 2018). Ozen & Baycan (2022) believe that small regions are more likely to become reliant on "global knowledge flows" compared to larger regions, which are prone to obtain considerable competitive advantage from their "division of labor". In addition, income also plays an important role when discussing the level of innovative achievements of regions. However, apart from size and income level, the sustainable economic development is the crucial factor that makes an important difference between regions that are classified as strong innovators and the ones classified as moderate or modest innovators.

In terms of enterprises innovativeness, Silva et al. (2021) reveal that small and medium enterprises play a crucial role in the region's productivity and in this sense, the cooperation between SMEs is considered a main strategy to increase the region's innovation capability and international competitiveness. Fiore et al. (2021) mention some of the advantages of creating innovative clusters within regions. In this sense, the authors identify the importance of collaboration through knowledge exchange and the cultural links created within the members of the cluster. Public policies have a significant role in the overall efficiency of the clusters, especially because these can influence the development of both formal and informal networks and contribute to speeding up the innovation process (Silva et al., 2021). Rentková (2018) agrees that policies play an important role in addressing the disparities amongst regions, namely the weak sides of the regions. In the own acceptance of Fiore et al. (2021), regional innovation systems can become valuable and deliver good outcomes, only if the policies implemented within such regions favor the development of a specialized labor market, with highly skilled human capital and facilitate the relationships between firms and universities. Considering the differences between regions in terms of economic, social and ecological level, it becomes imperative to understand the disparities and characteristics that make each region unique. In this sense, the methodologies and policies developed for each region can have a bigger impact in the overall innovation process (Lopes et al., 2021).

II. LITERATURE REVIEW

A crucial source of information on developing regional policies and regulations is the European Regional Innovation Scoreboard (RIS). The comparative nature of the European report is depicting the innovative performance of the member states and their regions, thus guiding decision makers when adopting resolutions. The RIS report comprises the following categories of indicators: enablers, firm activities and outputs (Lopes et al., 2021). According to the European report, the innovation indicators included in the first category, namely enablers, are population with tertiary education, R&D expenditure in the public & business sector; the indicators included in the second category, namely firm activities, are R&D expenditure in the business sector, non-R&D innovation expenditures for SMEs (small and medium enterprises), innovative SMEs collaborating with others, patent applications; indicators included in the outputs category are SMEs with product or process innovations, employment in manufacturing and knowledge intensive services, sales of new-to-market and new-to-firm innovations. Fiore et al. (2011) argue that regional innovation is an interactive process associated to the territory and consequently, to its actors and institutions, thus being a central component of the knowledge dissemination process and learning dynamics. The authors reveal that geographical proximity can represent an advantage when discussing regional innovation, however, the "spatial concentration" of local innovation stakeholders is not always enough. In this sense, the policies established through the collaboration between different actors is what fosters the development of sustainable growth and delivers economic advancement.

Silva et al. (2021) emphasize the role of smart specialization in the overall perception of regional innovation policies. This concept is also supported by the European Union and refers mainly to the adoption of an increased focused on R&D and human capital, a revitalization of the manufacturing production activities and diffusion of ICT. Moreover, the smart specialization initiative refers to directing government efforts and knowledge investments in activities specific to a region in terms of its specialization or a region where diversification can be turned into valuable profits. However, many regions fail to achieve the specific requirements needed to be included in the smart specialization category. Fiore et al. (2011) agree with the fact that specialized knowledge is what contributes to the competitive advantage of regions and can ensure specific advantages when addressing local "learning process and shared social values". Therefore, regional innovation gains considerable importance and represents a crucial factor in shaping the innovative capacity of the local system, as well as the innovation process and patterns.

According to innovation performance, regions are classified in four categories, namely modest, moderate, leader and strong (Rentková, 2018). When addressing the four categories of regions in terms of innovativeness, Lopes et al. (2018) reveal that the following indicators should be followed closely: innovative SMEs collaborating with others and sales of new-to-market and new-to-firm innovations. The regions classified as Leader in terms of innovativeness are more competitive and able to generate knowledge more effectively. The regions classified as Strong have to develop their innovation absorption capacity and improve their in-house innovation capabilities. The third place in the Regional Innovation Scoreboard is occupied by Moderate innovators. These regions are lacking in terms of internal innovative capacity and collaboration with other actors in the system. In this sense, a key improvement within the regions classified as moderate innovators should focus

on finding funding and solutions for in-house innovations and increase collaboration with innovative firms (Lopes et al., 2018). Rentková (2018) suggests that for Moderate regions, investment in human capital is very important, especially because the collaboration between higher education institutions and enterprises facilitates the knowledge exchange. Silva et al. (2021) agree that human capital is one of the most important factors when considering the economic advancement of regions. Human resources can therefore be considered an important comparative advantage in terms of skills, expertise and intellect. In this sense, the indicator suggested by the RIS report is the percentage of population with tertiary education, which is considered an important predictor that facilitates regions to grow from modest category to moderate one. Additionally, Lopes et al. (2021) support the idea according to which, regions that score as moderate in innovation performance can aim to pass into the strong category by implementing measures related to patent application and through enhancing collaboration with innovative SMEs. In this sense, the creation of partnerships with specialized institutions though tailored consultancy can increase the performance of such regions. R&D infrastructure can be increased through the development of innovative clusters and platforms that facilitate collaboration and cooperation between enterprises in the same region or across regions. The Modest regions are the least innovative ones and lack in developing internal innovative products and the required infrastructure to collaborate with others. Additionally, funding is another problem of these regions and it reflects in their incapacity to generate growth in innovation turnover. Public policies comprise a viable solution for Modest regions and can contribute to driving forward the innovation initiatives and establish good practices in the overall innovation process (Lopes et al., 2018).

III.REGIONAL INNOVATION IN ROMANIA

According to the Regional Innovation Scoreboard (RIS), Romania is classified as a Modest Innovator. Romania is grouped into eight regions, namely: Bucharest-Ilfov (RO32), North-East (RO21), South-East (RO22), South Muntenia (RO31), South-West Oltenia (RO41), West (RO42), North-West (RO11) and Centru region (RO12). The European regional report shows that all regions within Romania are considered Modest Innovators, with the exception of Bucharest-Ilfov region, which is classified as a Moderate Innovator, thus meaning it is the most innovative region in the country. According to the Regional Innovation Scoreboard, the innovation indicators for which the Bucharest-Ilfov region scores low are the following: collaboration between R&D sectors and industry, non-correlation between universities' researches and SMEs, and poor protection of intellectual property rights (Șerbănică, 2011).

Șerbănică (2011) reveals that SMEs from the North East region perceive innovation as a costly activity that benefits the academic environment, therefore no real benefits are identified for the short-term reality of enterprises. Moreover, the author notes the perception according to which there is a lack of proper equipment for the development of R&D activities. For the South Muntenia region, it should be noted that despite the existing partnerships between SMEs and universities, „the level of cooperation is very low". A reason for this is represented by the lack of correlation between the research objectives established by universities and the market realities of SMEs. Therefore, it becomes evident that regional disparities are predominant, which translates into slow economic transformation and a lack of performant institutions. Possible solutions for such disparities could be represented by the adoption of a common strategy or public policy that could support efforts in addressing the identified issues or as acknowledged by Șerbănică (2011), the creation of information circles, where leaders in innovation could help create and develop collaborative innovation groups. These spaces would facilitate the knowledge transfer between regions and would contribute to the development of stronger business and research system alike. Ogrean & Herciu (2020) note that South-West Oltenia is one of the lowest performing regions, three times less than Bucharest-Ilfov region, one of the most innovative within the country. The West and North-West regions score low in terms of low adaptation to market conditions and low number of people who remain in the research area in universities and research centers. To this, it can be added the lack of funding and institutional communication that could promote the entrepreneurial culture. Finally, the Centru region shows strengths in terms of employment in manufacturing and knowledge intensive services and innovative SMEs collaborating with others, whilst the R&D expenditures in the public sector is identified as absolute weakness (Ogrean & Herciu, 2020).

Dodescu & Chirilă (2012) highlight that innovation is produced at regional level through the development and collaboration between clusters, networks and research institutions. Regional governance plays an important role in supporting innovation at regional level especially through the development of regional structures. The authors agree with the fact that Romania lacks in terms of attracting research systems, especially regarding indicators such as innovative SMEs, patent applications and investment in R&D. However, several strengths are noticed, such as firm investment and human resources. In addition, Goschin (2014) reveals that one of the factors for the disparities existent within regions is the unbalanced R&D potential. The largest part of R&D investments and initiatives is located within the Bucharest-Ilfov region, a major disparity compared to the rest of Romanian regions. Although the government is working on defining a regional R&D strategy, the lack of coordination between local and regional policies represents a main cause for the disparities. Furthermore, Șerbănică et al. (2014) also discuss several causes of the disparities noticed in terms of innovative endeavors in Romania and

other countries from Central and Easter Europe. In this sense, the authors highlight that during the socialist period, Romania has followed a linear innovation model and horizontal cooperation was very limited. Moreover, at the center of the R&D system there was no place for universities, and post-communist efforts did not prioritize the sector, which explains the major lacking in terms of labor force and policy initiatives in this area. In addition the authors outline the low number of enterprises that perform R&D activities and the low developed sector of industrial production. However, the last years show that several efforts have been made, especially in the collaboration area, where policies have supported the development of clusters and the circulation of knowledge between the industry and universities. Dan (2012) supports the idea of creating common spaces between enterprises, universities and regional authorities and confirm that such spaces or clusters would facilitate knowledge spillovers, encourage entrepreneurship, promote economic growth and ultimately enhance the local innovation potential. The European Union supports the creation of clusters, which benefit communities in terms of creating competitive advantage, revitalize industrial sectors, and influence change at local level. The main idea behind the European supports refers to discovering the potential of a region and where it could be positioned in a mid-term perspective if development conditions would be provided. Policies have an important role in this sense, because they can stimulate the existing environment and encourage growth through networking and the establishment of a favorable microeconomic business environment. Funding is another support offered for clusters, and in this sense, Dan (2012) highlights that both European and Romanian funds are available. Some examples related to this include the European Regional Development Fund, the European Social Fund and for Romanian funding, there should be noted the National Strategy Frame Programme, the National Strategy for Research Development and Innovation and the National Strategy for Sustainable Development of Romania.

IV.METHODOLOGY

Considering the discrepancies between the Bucharest-Ilfov region and the other regions within Romania, the main objective of this paper is to understand why the Bucharest-Ilfov region differs from other Romanian regions in terms of innovativeness. In addition, the analysis of the regional innovation performance is a useful exercise for a plethora of stakeholders such as policy makers, authorities, academics and enterprises. This can help understand regional strengths and how these can be applied in each unique region. For this purpose, we have used the benchmarking concept and a qualitative approach, employing a descriptive and explanatory dimension by selecting the case study method.

Dragolea & Cotîrlea (2009) reveal that benchmarking is a process that aims to uncover "best practices that lead to superior performance" and it is performed over a period of time with the data available for the entities that are being compared. The application of the benchmarking concept has numerous benefits, amongst which are worth mentioning the development of a culture that seeks continuous improvement, fostering the latest innovations and anticipating changes in the external environment. Kozak & Nield (2001) affirm that benchmarking is a measure of continuous improvement in the sense that the performance of an organization or institution will be measured against a reference that performs the best. Therefore, the benchmarking process can be viewed as a process where organizations, institutions or agencies learn from the best and apply these learning into their current practices. The flow of the benchmarking process comprises performance comparison, gap identification and the subsequent change management. The result of a benchmarking analysis is to deliver recommendations that can further drive competitive advantage through "stimulation of continuous improvements". Nazarko et al. (2009) agree that benchmarking is a procedure used for "increasing productivity and accelerating changes". The authors reveal that the core of benchmarking is the learning process, and adaptation practices implemented after depicting best practices and results delivered by others, the main goal being the achievement of competitive advantage.

Kozak & Nield (2001) identify several types of benchmarking, namely internal, competitive, and functional benchmarking. Internal benchmarking refers to depicting a common ground within the same organization and comparing internal performance in an attempt to achieve overall better performance. Competitive benchmarking is directed towards direct competitors and it is the most difficult to assess considering the barriers to communication between opponent enterprises. Functional benchmarking assesses the comparison between competitors or entities that operate in the same industry in similar fields. Furthermore, Nazarko et al. (2009) divide the benchmarking process into several steps, the first being the understanding of the type of benchmarking used, followed by the identification of the entities that are being compared. After gathering the data required for the benchmarking process, the next step, namely analysis includes identifying the differences between the efficiency indicators. The last step is the adaptation phase, where the implementation plan is being pursued to create a continuous improvement approach and apply change.

Dubrovskaya et al. (2018) reveal that benchmarking can be successfully applied to territorial units and highlight a new type of benchmarking, namely regional benchmarking. This refers to understanding the actual development of a territory in terms of innovativeness. In this sense, Dubrovskaya et al. (2018) suggest to analyze several attributes of the territory such as "size, population density, economic structure, geographical location and innovation level". The territory size and the population are important constituents of the region's characteristics,

because of the effect on production. Moreover, indicators such as the population of working age and their specialization are aligned with the efficiency of the region's economy. In this sense, education is another important factor because it contributed to the development of the intellectual capital and the potential innovation capability. Arancegui et al. (2012) acknowledge that regional policies should focus on two main objectives, namely developing strong regional strengths in key innovative areas and focus on continuous improvement through active management of weaknesses. Benchmarking plays an important role in this sense due to its general perception as a continuous improvement technique based on comparison and its outcome, namely that of learning from the best and implementing the knowledge gathered. Following this line of thought, benchmarking can be viewed as a starting point for identifying strengths and weaknesses and formulating strategies based on these findings. Arancegui et al. (2012) argue that benchmarking should not be mistaken for a copy and paste exercise, but rather as an analysis of depicting good practices, and examine overall performance within the entities analyzed. When it comes to regional benchmarking, the authors agree that the comparison can be performed after establishing several criteria, such as comparison with other regions over time, regions location, high performance or economic structure. The innovation process represent a solid criterion for measuring regions' performance. In this sense, innovation inputs and outputs are important indicators in the comparison exercise.

Addressing research methodology, Njie & Asimiran (2014) affirm that qualitative research allows for the understanding of certain complexities and situations comprised in the relationship within entities, an approach that is more useful than a mere calculation of results. The qualitative method involves an "interpretative, naturalistic approach", allowing for finding the meaning of phenomena and research through collecting empirical materials. This research method goes at the core of a situation and allows for the development of a thorough understanding of a situation or process through "observations and follow-up questions". Furthermore, qualitative research can comprise both a descriptive and an interpretative sense. The descriptive part reveals the essence of a "situation, setting or process", while the interpretative part provides new insights into concepts or problems. The evaluation of the research output allows for the interpretation of the effectiveness of specific practices or processes and contributes with recommendations of policies and solutions for implementation. The case study is part of the qualitative approach and is focused on depicting the depths of a phenomenon situated within a particular context. Baxter & Jack (2008) agree that the case study is a detailed investigation, collecting data over a period of time, specific for a situation or event placed in real life. Therefore, the case study provides answers to "how" or "why" questions and delivers extensive knowledge on a particular topic and its social and political context. The authors underline the differences between the types of case studies. In this sense, the authors describe five types of case studies, namely explanatory, exploratory, descriptive, intrinsic and instrumental. The explanatory case study usually approaches complex events or phenomena that are not suited for surveys or experimental strategies. The exploratory case study is used for investigating situations whose outcomes are not previously known. The descriptive case study focuses on detailing a phenomenon or real-life situation. The intrinsic case study is used when researcher have a considerable interest in the topic and want to develop thorough understanding around the research subject. Finally, the instrumental case study is used for refining a theory or delivering a particular outcome for a specific topic. This type of case study is used as secondary to another selected type of research (Baxter & Jack, 2008).

V.FINDINGS

Bucharest-Ilfov region is of the eight Romanian regions described in the Regional Innovation Scoreboard. It includes the Bucharest municipality, which is the capital city of Romania and Ilfov county. The region are is 1.804 km^2 and the total population is more than 2.5 million. The region network is comprises eight cities, 32 communes and 91 villages. According to the Agency for Regional Development, Bucharest-Ilfov is one of the most developed regions in Romania and despite its unfavorable geographical position, this region represents one of largest industrial agglomeration in Romania.

For the purposes of this paper, we have analyzed the evolution of the Bucharest-Ilfov region during 2014-2021 based on the data from the Regional Innovation Scoreboard, a report developed by the European Commission and published every two years. By using the benchmarking technique, described in the methodology chapter, we have compared the innovation performance of Bucharest-Ilfov region with the other seven regions in Romania. The analysis aimed to understand how the Bucharest-Ilfov region managed to perform within the selected timeframe compared to the other regions, depict learnings regarding the innovation performance, understand how less performing regions can improve and propose recommendations for policy makers and the entrepreneurial environment. For calculation purposes, we have used the three main categories of innovation indicators developed by the European Commission and shown in the European regional report, namely enablers, firm activities and outputs. In addition, considering the data structuring in the RIS, for the three main categories of innovation performance indicators, we have computed averages over the selected period of time, namely 2014 - 2021, instead of percentages changes. Therefore, the first category, Enablers, included two indicators, namely population with tertiary education and R&D expenditure in the public sector. The second category, Firm

Activities, included four indicators, namely R&D expenditure in the business sector, mon-R&D innovation expenditures, innovative SMEs collaborating with others and patent application. The last category, namely Outputs, included the following indicators: SMEs with product or process innovations, employment in knowledge intensive services and sales of new-to-market and new-to-firm innovations. In addition, for discussion purposes, we have portrayed the results obtained using a table format. This helps to better depict the differences between regions and identify the ranks for each Romanian region. The results are displayed in the tables below.

Table 1. Averages for "Enablers" innovation indicators within timeframe 2014-2021

RO	Region	ENABLERS	
		AVERAGES 2014-2021	
		Population with tertiary education	R&D expenditure in the public sector
RO32	Bucharest-Ilfov	0.736	0.378
RO21	North-East	0.142	0.179
RO22	South-East	0.144	0.085
RO31	South Muntenia	0.127	0.052
RO41	South-West Oltenia	0.206	0.137
RO11	North-West	0.276	0.178
RO12	Centru	0.244	0.089

Table 2. Averages for "Firm Activities" innovation indicators within timeframe 2014-2021

RO	Region	FIRM ACTIVITIES			
		AVERAGES 2014-2021			
		R&D expenditure in the business sector	Non-R&D innovation expenditures	Innovative SMEs collaborating with others	Patent applications
RO32	Bucharest-Ilfov	0.232	0.145	0.136	0.119
RO21	North-East	0.063	0.178	0.054	0.064
RO22	South-East	0.021	0.296	0.073	0.042
RO31	South Muntenia	0.206	0.144	0.041	0.056
RO41	South-West Oltenia	0.033	0.034	0.025	0.044
RO11	North-West	0.079	0.125	0.061	0.089
RO12	Centru	0.138	0.162	0.038	0.077

Table 3. Averages for "Outputs" innovation indicators within timeframe 2014-2021

RO	Region	OUTPUTS		
		AVERAGES 2014-2021		
		SMEs with product or process innovations	Employment in knowledge intensive services	Sales of new-to-market and new-to-firm innovations
RO32	Bucharest-Ilfov	0.067	0.661	0.223
RO21	North-East	0.089	0.221	0.225
RO22	South-East	0.176	0.337	0.246
RO31	South Muntenia	0.087	0.525	0.236
RO41	South-West Oltenia	0.018	0.471	0.160
RO11	North-West	0.116	0.311	0.218
RO12	Centru	0.072	0.469	0.233

The results encompass data from the Regional Innovation Scoreboard from years 2014 until 2021 and author's own calculations. The data shows that Bucharest-Ilfov region has managed to score higher values within the selected timeframe for a series of indicators, however other regions are closely following in terms of ranking, which is an indicator of the potential of such regions to achieve the Moderate innovator group.

The first category, Enablers, reflects a considerable high score for both indicators for the Bucharest-Ilfov region. The second and third rankings are represented by the North-West and Centru region in the case of population with tertiary education and by the North-East and North-West regions in the case of R&D expenditure in the public sector. The lowest score for both indicators is registered for the South Muntenia region. Financial difficulties, education migration, and the overall number of available institutions in smaller cities can explain possible causes for the poor results in terms of academic achievements. However, the development of a more inclusive educational environment has many benefits, as highlighted by Yotova & Stefanova (2017). Camps & Marques (2014) emphasize the importance of human capital and that knowledge flows could contribute to an increased creativity within the firm and therefore an expanded innovation capability. A solution for increasing the percentages of individuals with tertiary education is correlated to the state financing. Subsidies can be offered to both students and educational institutions, while also considering private expenditures (Yotova & Stefanova, 2017). Currently in Romania, there have been some improvements regarding the funding of tertiary education, namely a combined approach of funding sources from both public and private institutions. Another solution proposed for reducing education migration refers to increasing the attractiveness of the actual programs offered by Romanian universities. The possibility to study in foreign languages, to acquire skills and knowledge with a

different, more practical approach, and additionally develop partnerships with enterprises for exchanging programs are all solutions that can potentially contribute to increase the interest in tertiary education (Yotova & Stefanova, 2017). The development of social capital contributes to the development of new products, services, processes, advancement of new technology, production and management practices, and therefore positively influence firm activities (Camps & Marques, 2014).

The second category, Firm activities, places the focus on R&D expenditures, patent application and overall investments in the business sector. The results show that Bucharest-Ilfov region also scores high in these indicators compared to other regions. South Muntenia and South East regions score the second and third rankings, while the other regions remain at generally lower values. R&D investment is a major focus for the entire country considering the objectives of the European Union for the next years in terms of economic growth. In the own acceptance of Ciucă et al. (2016), a considerable challenge for Romania is the low competitiveness and the underdeveloped innovation culture. The business sector is majorly composed of technology-based enterprises of medium and low level, and the overall "presence of R&D is low". Main causes for the current situation of R&D in Romania are public spending, fiscal incentives, and the total numbers of researchers (Ciucă et al., 2016). As agreed by Sandu & Anghel (2012), these challenges are interrelated and cannot be attributed to a single sector or industry. Possible solutions include placing more focus on efficiency and smart economic growth, which includes an increase in the innovation efforts, and development of human resources in terms of professional skills and academic preparation. Personnel is one of the most valuable assets of enterprises, as revealed by Sandu & Anghel (2012). However, Ciucă et al. (2016) note that public institutions do place a considerable effort in developing research activities and the extension of such efforts is also recommended for the business sector. Moreover, Sandu & Anghel (2012) highlight that other solutions include incentivizing private research to ensure the transfer and dissemination of knowledge; increase the funding allocated for the research sector and implement policies that support both public and business sector.

The third category, Outputs, is a consolidation of all the innovation indicators discussed previously. This category encompasses the results of the innovation inputs and refers to innovative enterprises, employment based on knowledge exchange and the results of sales of new to market and new to firm products. For the case of Romania, the results show that Bucharest-Ilfov, South Muntenia and South East regions occupy the first rankings. The human capital and the financial means represent the catalyst for why some regions, such as the Bucharest-Ilfov region, perform better than others, especially when it comes to delivering innovative products or processes (Boldureanu et al., 2017). Moreover, at local and national level, the innovative capacity of enterprises can affect the economic competitiveness. In this sense, although the only region in Romania that is categorized as Moderate innovator is Bucharest-Ilfov, the overall score for the country is that of a Modest innovator. This leaves to room for the other regions in Romania to implement several solutions in order to achieve a Moderate innovator level such as the Bucharest-Ilfov region (Boldureanu et al., 2017). Gherghina et al. (2020) note that besides technological advancements, knowledge development is an important economic resource with considerable impact on performance and competitiveness. This can represent an important opportunity for SMEs to secure a "solid position on the market". However, funding remains a crucial topic both at European level, as well as at local and regional level. The allocation of grants can make a difference in terms of the innovativeness classification of a region. To this, Gherghina et al. (2020) add that the stimulation of SMEs through public policy to engage in more research oriented activities and develop partnerships with universities or research centers can attenuate the vulnerabilities of certain regions. In terms of innovative products, Diaconu & Vilcu (2018) reveal that in Romania, there are more new to firm products than new to market. Besides the low scores in R&D, another reason for this is that many enterprises are focused on delivering innovative products at local level rather than placing the focus on global level.

All in all, the findings suggest that except Bucharest-Ilfov region, an increased focus on the other Romanian regions at both local and regional level from authorities, policy makers and the business sector could make a significant difference in terms of the category of innovativeness.

VI.CONCLUSION

This paper presents new findings in terms of the regional innovation performance of Romanian regions. The approach used is the benchmarking technique that allows assessing the achievements of Bucharest-Ilfov region compared to the other seven Romanian regions, as designed by the Regional Innovation Scoreboard over a period of seven years. As regional innovation gains increased importance at European level, the local focus of authorities and the private sector should be on implementing local and regional policies to support the advancement of new technologies and research in order to achieve economic growth. This result of the present research shows that few innovation indicators are strongly positioned within Romanian regions and one of the most important one is the social capital. As Camps & Marques (2014) agree, social capital, an innovation enabler, has the utmost importance in the innovation process, because this indicator has multiple dimensions and is connected with all other indicators in the process of accessing, disseminating information and developing a

creative environment, which ultimately support innovation. The research findings reveal that despite the low level of innovation and R&D activities in Romania, small enterprises can pose a crucial opportunity as economy catalysts. The engagement of small firms in delivering new to firm products represent an important innovation strategy that can be used by policy makers to further emphasize economic growth. Another finding indicates that an increase in collaboration between the private and the academic environment, with focus on R&D can provide additional support for innovation in Romania.

Our recommendation is for authorities to develop new public policies and implement funding programs to support the efforts of universities, enterprises and local advisors and incentivize regions to achieve better performance in terms of innovation.

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