

Innovation in Public Sector through European Funds: What is the Role of Local Authorities in Regional Development and Implementation of Smart City Solutions in Romania?

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Abstract

21st century is becoming more and more a period of new social, natural, economic and political paradigms, a century of contrasts, disruptive technologies and speed. Thus, there is a growing need for continuous innovation, in all fields, with the support of advanced technologies and concepts. But who will take the main role in implementing long-term solutions, development strategies that are holistic, integrated and relevant for smart and sustainable regions? Lately, more and more local public authorities in Romania are interested in developing smart solutions that improve the quality of life and enhance the possibility of (re)using available resources, thus contributing to regional development through accessing available European funding. At the same time, we observe there are enough public funds available to implement such smart solutions and public administrations are forced to use their experience and innovative capacity in order to attract funds to develop smart projects.

Key words: regional development, smart city, European funding, public sector, innovation

J.E.L. classification: H83, O31, O38, R11

1. Introduction

In the literature specialized on debating concepts such as innovation or smart city several opinions have crystallized calling for a more systemic approach to these concepts, beyond the use of ICT and other disruptive technologies, taking into account human factors as well (Pultrone, 2014; Albino et al., 2015). As Nam and Pardo (2011) suggest, smart city solutions should be based on integrated services, not system-driven, i.e. a smart city project should address existing problems in a city without the belief that only the use of ICT will automatically produce smart city solutions or sustainable development. Moreover, they point out that 85% of public IT projects fail mainly due to non-technical factors, such as organization, policy and management. As a result, these considerations require public policy initiatives aimed at focusing efforts on addressing and remedying possible uneven results of ICT applications and use (Walters, 2011).

In this context, the role of local public authorities in the development of innovation, sustainable development and smart city projects is crucial, firstly because they represent the actors initiating smart city initiatives and development strategies and, secondly, because innovative solutions cover many areas and therefore require an integrated approach. Equally, local authorities are the actors that create the societal and institutional context, acting as orchestrators with executive authority and policy planning competences (Nam and Pardo, 2011; Zygiari, 2013; Neirotti et al., 2014).

It is a well-known fact that EU funded projects have an impact on the organizations that implement them, on the stakeholders, as well as on the regions in which they are implemented. These projects aim at developing regions and achieving the European goal of sustainable

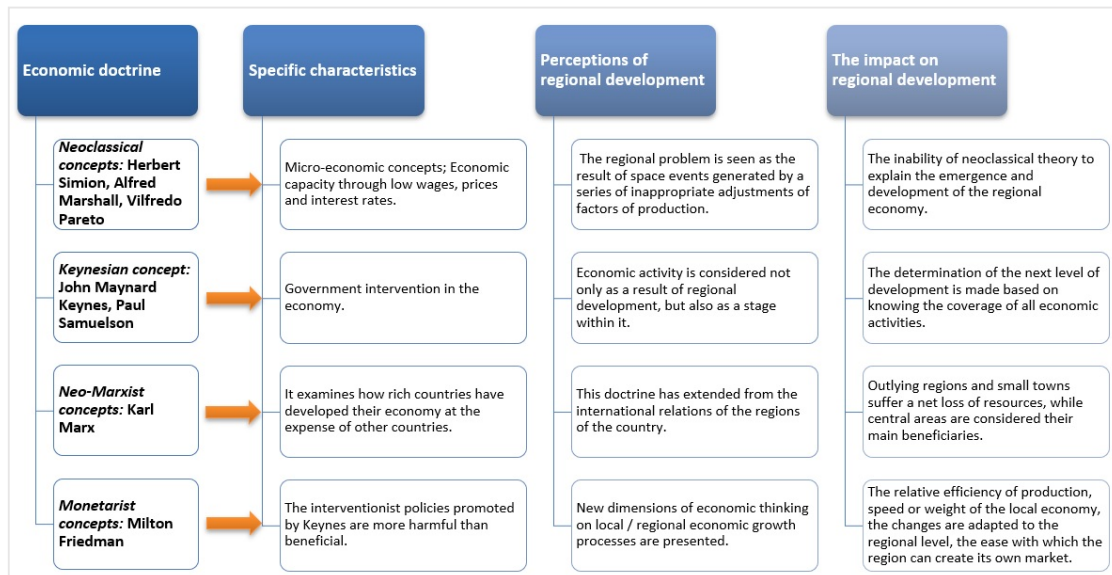
development. Given the large number of investments initiated by projects in the European Union, it is necessary to assess the impact of these projects on the local and regional economy, respectively, to analyze the effects created to verify whether the proposed objectives have been achieved or not, especially since through these projects initiated mainly by local authorities, a smart sustainable development is being promised.

2. Theoretical considerations on regional development

To understand the concept of regional development, we must first analyze the term *region*. Some theorists claim that the region is only a territory located in a certain area, while others are based on more explicit theories and definitions. Christaller (1933) and Losch (1954) defined the “region” by providing a suitable approach of the concept. Thus, in their view, regions are seen as systems based on a hierarchy of places or cities. A region consists of a few large cities and numerous small towns and the order of a city seems to be determined by the number of goods and the size of the market offering them. Also, it is important to notice that importing and exporting goods is a frequent practice among larger and smaller cities. Hoover and Giarratani (1985), in turn, consider that activities within a region circle around a predominant node as opposed to the peripheral surrounding area. This popular theory of the nodes is later developed by Karl Fox's idea of the "functional economic zone" (Fox, 1996). This whole concept provides in our opinion a good framework for defining economic areas.

In order to have a better view on the complexity of regional development, it would be useful to acknowledge that there are some economic doctrines that influenced the phenomenon of regional development, as illustrated in Figure no. 1.

Figure no. 1. Economic doctrines and their influence on regional development.



Source: authors' own elaboration.

Based on Figure no. 1, we can observe a vision of economic development, which is different for each researcher, and the complexity of the theory depends on the factors underlying its development. Based on the information currently available, we can say that regional development focuses on the economic mechanisms of self-regulation, complemented by state interventionist policies and the ability of regions to be competitive.

3. Research methodology

The aim of the research is to conduct an analysis on the role of local public authorities in attracting EU funds and thus contributing to the regional development and implementation of smart city solutions. In this context, one of the research methodologies is represented by the analysis and presentation of some theoretical concepts regarding regional development or European Union financing programs. The main method of documentation was represented by the content analysis, to which the authors added the comparative method used to highlight the characteristics of the analyzed concepts and notions. Also, documents and statistics regarding the absorption of EU funds in Romania were consulted and analyzed. Conclusions were formulated with regards to the innovation in the public sector as a prerequisite for further regional sustainable development and ensuring the durability of smart city projects.

4. Opportunities for local authorities to finance projects through EU programs

European regional policy promotes the economic development of the poor regions of the Community. Participating in reducing disparities in the economic development of individual regions is seen as one of the tasks of the European Union. In paragraph 2 of Article 158 of the Treaty establishing the European Community states as its main objective the reduction of disparities in the development of the various regions and the delay of the poorest of them. At present, equalization of regional development is an important aspect of the European market economy and determines the EU's regional development policy. To create equalization of regional development, several funds are available, namely: the European Social Fund, the European Regional Development Fund and the Cohesion Fund. These represent EU's financial instruments for implementing regional policy, which in turn has as objective the reducing the development gaps among different regions and EU member states. In this context, it is safe to conclude that the funds have an enormous impact on strengthening economic, social and territorial integrity.

The use of regional policy instruments depends to a large extent on the potential of the regions, on the territorial differences in their development, on the particularities of regional issues, on the level of decentralization of public administration and on regional autonomy. The characteristic of EU regional policy is the strengthening of the homogeneity of national policy, the convergence of principles and mechanisms for its implementation, increasing the central government's initiative to reduce regional disparities, giving regional investment preference over regional incentives, focusing on capital investment and employment. for work.

EU Structural Funds include:

- European Social Fund, the oldest of the Structural Funds, set up in 1958 under the Treaty of Rome. It has the status of the EU's main financial instrument in the field of employment.
- The idea of supporting underdeveloped regions in terms of scientific and technological progress has quickly materialized. In 1975, the European Regional Development Fund was set up in order to develop the infrastructure of the regions, to stimulate job creation, to support and also to boost local projects, etc. It is no doubt that the European Regional Development Fund contributes to reducing disparities among regions because, among other, it aims at financing the development of transport and communications infrastructure in EU regions, such as construction of roads, highways, etc.
- The last decade of the twentieth century is characterized by the intensive improvement of regional development policy. Cohesion Fund has been set up under the EU Treaty, better known as the Maastricht Treaty (1992). The Cohesion Fund was set up in 1993 to further strengthen the Community's structural policy. The fund's task is to finance the development of transport infrastructure and environmental projects.

About 35.7% of the EU budget in 2007-2013 was allocated to support cohesion policy and regional development. For the period 2007-2013, the European Council approved a budget for structural programs of 347 billion euros. The funds are divided into three main financial instruments: the European Regional Development Fund, the European Social Fund and the Cohesion Fund. The activities of the European Regional Development Fund focus on four

priorities: innovation and research; development of digital technologies; support for small and medium-sized enterprises; low carbon economy.

5. Current status and perspectives on the implementation of European projects in Romania

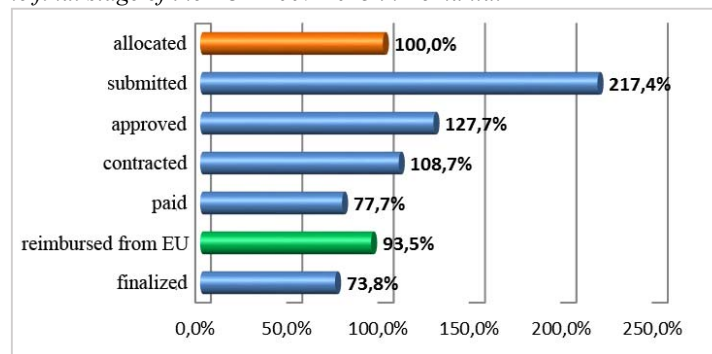
Given the crucial role played by the local public authorities in the process of EU funds absorption and the design and implementation of smart city solutions, we consider important that we analyze the situation in Romania of European grants, since they have proven their benefits to developing some regions of Romania and have become an engine that has launched many smart initiatives in cities such as Alba Iulia, Cluj, Oradea, Bucharest and Timisoara.

The strategic programs on smart cities were initiated in Romania in close connection with programs run by the European Union. Dedicated transnational bodies (e.g., European Union funding programs and grants) have played a key role in what type of projects have been carried out in the country and in what timeframe they have reached the expected results. In particular, the Regional Operational Program (both the one from the previous programming period, 2007-2013 and the one still in implementation, ROP 2014-2020), which was also initiated by the European Union, had a key role in the projects developed by cities in all development regions, resulting in smart city solutions. European Union programs have created the possibility for local authorities to apply for funding in the area of smart cities, but also to enhance sustainable development. The programs also indicated specific objectives of smart sustainable cities, leaving some freedom to the regions, while giving priority to areas (such as, for example, Internet-based infrastructure and technologies). In addition, we believe that EU funding programs have contributed (at least in Romania) to fragmentation in regional development, as many of the projects have been won and implemented by experienced local authorities, and they have been carried out exclusively over a specific period of time.

The general objective of the Regional Operational Program 2007-2013 (ROP) was to support an economic, social, territorially balanced and sustainable development of Romania's regions, corresponding to their specific needs and resources, by focusing on urban growth poles, by improving infrastructural conditions and business environment to make the regions of Romania, especially the ones left behind, more attractive places to live, visit, invest and work. Main beneficiary of ROP 2007-2013 was represented by the public sector, that is local public authorities. This is a clear indication in our opinion that the main actor with responsibilities in regional development in Romania is the public administration.

The value of the community funds (ERDF) allocated to the ROP for the period 2007-2013 was 3,966,021,762 euros, and at the end of October 2016 the stage of implementation of the program was as follows:

Figure no. 2. The final stage of the ROP 2007-2013 in Romania.



Source: ROP 2007-2013, Final Implementation Report (2017).

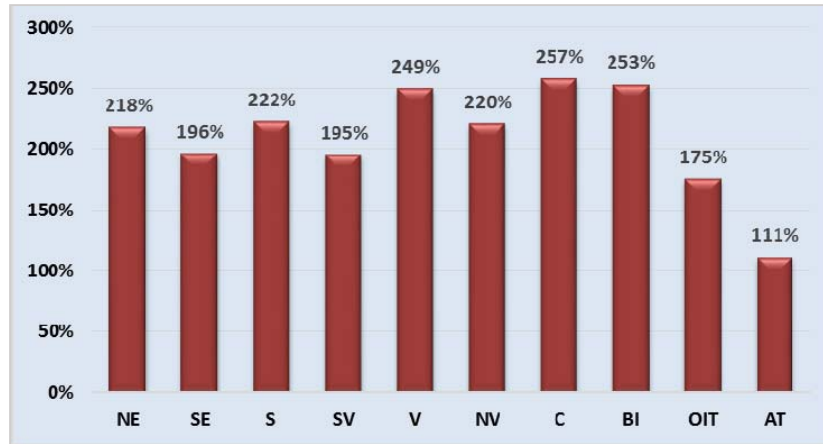
The analysis of the ratio between the most developed and the least developed region, in terms of GDP / inhabitant, shows a constant increase of up to 1: 4 in the period up to 2008, followed by a sharp decrease in the range of 1:3.8 - 1:3.9 during the years 2009-2010, so that in 2011 is registered

a significant increase, representing the double of the previous fall, with 1:4.26. Finally, in the period 2012-2014 there is a return in the range 1:3.8 - 1:3.9.

We thus observe that, when compared to the trend of constant growth in regional disparities, registered before 2008, the period between 2008-2014 is characterized by a relative stagnation of regional disparities in the range 1:3.7 - 1:3.9.

At the regional level, there are different levels of demand for funds allocated, of approximately or even over 200% in all eight development regions of Romania, which highlights the high needs that exist in all development regions in the areas financed by the ROP, which recommended continuing their funding in the 2014-2020 programming period as well.

Figure no. 3. Financing applications submitted by regions within the ROP 2007-2013 in Romania.



Source: ROP 2007-2013, Final Implementation Report (2017).

A total of 4,554 financing contracts were signed, totaling 6.96 billion euros, of which the value of the ERDF represented 4.31 billion euros (contracting rate of 108.7%).

Table no. 1. Degree of contracting funds through ROP 2007-2013 by domains and regions.

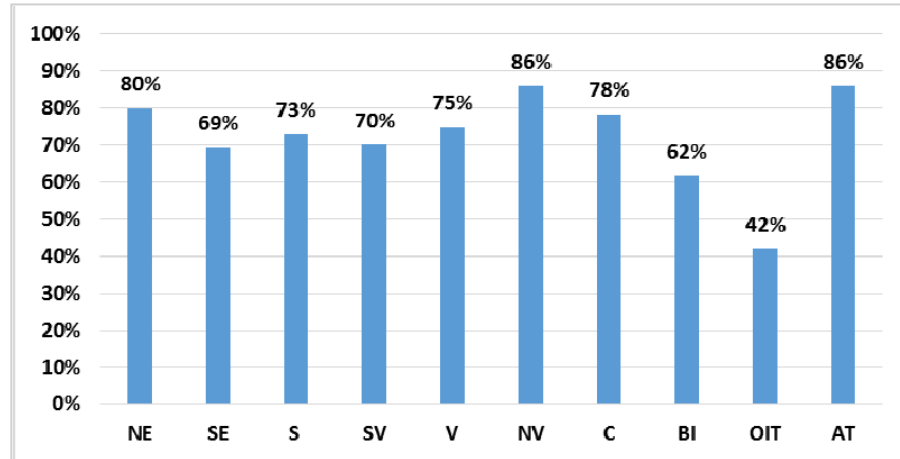
Domains of intervention/ Region	NE	SE	S	SV	V	NV	C	BI	ROP
Growth poles	96%	94%	103%	99%	86%	105%	108%	NA	99%
Development poles	110%	133%	109%	112%	123%	154%	101%	NA	120%
Urban centers	164%	111%	140%	136%	136%	100%	159%	104%	128%
Energetic efficiency	10%	16%	17%	36%	111%	167%	89%	820%	125%
Road infrastructure	104%	109%	122%	124%	129%	131%	116%	110%	118%
Health infrastructure	125%	137%	101%	94%	127%	112%	112%	91%	111%
Social infrastructure	110%	127%	116%	113%	112%	124%	116%	106%	116%
Emergency equipment	106%	65%	113%	101%	103%	117%	115%	132%	105%
Educational infrastructure	120%	103%	130%	105%	125%	177%	91%	68%	117%
Business infrastructure	91%	43%	83%	43%	99%	91%	72%	115%	79%
Industrial sites	NA	NA	NA	NA	78%	NA	119%	NA	87%
Small companies	110%	106%	119%	94%	101%	97%	109%	92%	105%
Cultural heritage	98%	119%	98%	105%	87%	108%	103%	92%	102%
Accommodation and tourist leisure	99%	93%	78%	119%	79%	140%	109%	87%	101%

Total per region	108%	104%	111%	106%	110%	122%	110%	113%	110%
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Source: ROP 2007-2013, Final Implementation Report (2017).

As for the completed projects, they totaled 4,491 completed projects, with a total eligible value of EUR 3.67 billion, of which the ERDF contribution was EUR 2.93 billion (representing 74% of the ERDF allocation of the ROP).

Figure no. 4. Financing applications finalized by regions within the ROP 2007-2013 in Romania.



Source: ROP 2007-2013, Final Implementation Report (2017).

At the regional level, the North-West, North-East and Central regions stand out, given that all regions recorded values of over 60%.

The strategic vision regarding the development needs that the ROP 2014-2020 must meet is based on the analysis of the economic and social situation of the Romanian regions (in the National Strategy for Regional Development 2014-2020), which led to defining some directions of strategic action mentioned by the European Commission regarding the financing from the European Structural and Investment Funds, through the European Regional Development Fund for the period 2014-2020:

- Innovation and research;
- Digital agenda;
- Support for small and medium enterprises (SMEs);
- Low carbon economy.

It is with this programming period that Romania enters a stage of financing that is superior to the one before, that is projects implemented by local authorities are meant to ensure a smart sustainable development with innovative solutions and care for natural resources. Technology is a main focus and its role is to support beneficiaries in proposing ambitious projects and initiatives for a smart future.

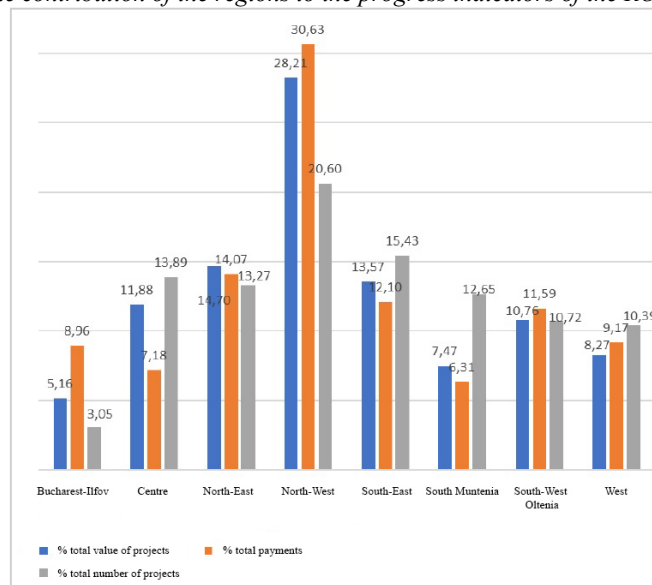
Regarding the current programming stage, with a total allocation of 8.384 billion euros, out of which 6.860 billion euros EU contribution, the Regional Operational Program 2014-2020 is the main instrument for financing regional development policy in Romania with still local public authorities as main beneficiaries. The objective of the program is the balanced development of the territory, respectively the reduction of the development gaps at the level of the 8 regions of Romania.

The situation of progress in the implementation of the ROP 2014-2020 shows that at national level there are a number of 3,572 projects contracted, respectively completed or being implemented (without Technical Assistance priority), amounting to 17.627 billion lei EU contribution (about 3.843 billion euros), the payments made to the beneficiaries amounting to about 2.475 billion lei (respectively 538 million euros). The analysis of the indicators referring to the number and value of contracted projects, as well as to the value of payments made to beneficiaries shows that the

situation of attracting ROP funds at regional level allows the identification of three categories of regions for each indicator: the "above average" category, which includes the regions with a very high level of each indicator analyzed; the "average" category, which includes regions with similar values and relatively balanced performance across all indicators; "below average" category, which includes regions with relatively lower values than other regions and relatively lower performance. Thus, the North-West region stands out as the leading region, with the number of projects, the values of projects and payments made higher than the rest of the country, concentrating between 30% and 20% of the total in the country on each indicator. The North-East, South-East and South-Muntenia regions are a group of "average" regions, with the rest of the regions making relatively lower progress, especially in terms of payments to beneficiaries.

The findings suggest the existence in Romania of a process of initiation and implementation of smart city initiatives funded by EU projects in which some factors play an important role. For example, the already existing economic disparities between the development regions in Romania create the context of different opportunities for local municipalities with more or less sufficient funds for the implementation of such projects. In addition, disparities in the economic development of different regions create a chain in the process of implementing smart city projects that work in favor of the most experienced local actors in developed regions: the ability to attract major private companies to invest in public-private partnerships for such of initiatives are not evenly distributed, and human resources are, moreover, concentrated in the most developed regions.

Figure no. 5. The contribution of the regions to the progress indicators of the ROP 2014-2020.



Source: Analysis of the ROP implementation system (2019).

Regional disparities and differences in economic development between development regions favor the emergence, implementation and success of smart city initiatives in the three most developed regions of the country: Ilfov Region, North-West Region and West Region, while the other regions are left behind. In our opinion, EU funds have come to support the already innovative and experiences local public authorities to implement smart projects for citizens and other stakeholders. What is left for academia and experts in regional development to examine whether the new programming period will carry on to accentuate regional disparities since it is already ruled that there will be as many ROPs as regions in Romania, with distinct allocation and adjusted estimated results according to the level of needs and development reached so far.

6. Conclusions

This research has unequivocally showed that the public authorities have a fundamental role to play in the long-term regional development and implementation of smart city solutions, with impact on both economic and social fields. Undoubtedly, the development of smart city solutions is more successful, and the urban ecosystem has a chance to evolve once the receptivity of stakeholders to the impact of digitalization and the exponential growth of public data is ensured. As already mentioned, this study intends to cover regions in Romania with cities that are transforming and / or have the potential to become smart cities. There are many key actors and roles involved in the development of smart cities, however, this study only includes the perspective of local public authorities, since they are the main beneficiary of EU funds meant for regional development in Romania in several fields that do no longer cover basic needs of citizens and communities, but require innovation, access to technology, digitalization, research and low carbon economy. With new EU financing programs for the period 2021-2027 approaching, we should start accepting that regional development is increasingly determined by social, cultural, spiritual, environmental, informational, technological and other factors, i.e., non-economic transfers.

7. Acknowledgement

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8. References

- Albino, V., Beradi, U., and Dangelico, R.M., 2015. Smart cities: definitions, dimensions, performance, and initiatives. *Journal of Urban Technology*, 22 (1): 3-21.
- Antonescu D., 2011 *Dezvoltarea Regională. Tendințe. Mecanisme. [Regional Development. Trends. Mechanisms]*. Bucharest, Top Form Publishing House.
- Capello, R., 2019. Regional Development Theories and Formalised Economic Approaches: An Evolving Relationship. *Italian Economic Journal*.
- Christaller W., 1933. *Die zentralen Orte in Süddeutschland*. [Central Places in Southern Germany]. Fischer, Jena.
- Hoover, E. M., Giarratani, F., 1984. *An introduction to regional economics*. Knopf, New York. ISBN 9780394334134.
- EU Cohesion Policy 2014 – 2020: legislative proposals. Available online at: http://www.ec.europa.eu/regional_policy/what/future/proposals_2014_2020_en.cfm
- Fox, K.A. Describing and measuring socioeconomic systems: Prerequisites to planning. *Soc Indic Res* 39, 281–305 (1996). <https://doi.org/10.1007/BF00286397>
- Lösch A., 1954. *The Economy of Location*. New Haven: Yale University Press. 520 pp.
- Nam, T., & Pardo, T. A., 2011. Smart city as urban innovation: Focusing on management, policy, and context. Paper presented at the *Proceedings of the 5th international conference on theory and practice of electronic governance*.
- Neirotti, P., De Marco, A., Cagliano, A.C., Mangano, G., and Scorrano, F., 2014. Current trends in smart city initiatives: Some stylised facts. *Cities*, 38: 25-36.
- POR 2007-2013, 2017. *Raport final de implementare [ROP 2007-2013 Final Implementation Report]*. [online]. Available at: <https://www.fonduri-structurale.ro/stiri/18221/a-fost-publicat-raportul-final-de-implementare-a-por-2007-2013>
- Pultrone, G., 2014. Partecipazione e governance. Per smart cities più umane [Participation and governance. For human-centred smart cities]. *TeMA Journal of Land Use, Mobility and Environment*, 7 (2): 159-171.
- Richardson, Harry W., 1979. *Regional economics*. Urbana : University of Illinois Press.
- ROREG, 2019. *Analiza sistemului de implementare a POR 2014-2020 [Analysis of the implementation system of ROP 2014-2020]*. [online]. Available at: <https://www.roreg.eu/>
- Walters, D., 2011. Smart cities, smart places, smart democracy: Form-based codes, electronic governance and the role of place in making smart cities. *Intelligent Buildings International*, 3 (3): 198-218.

- Zygiaris, S., 2013. Smart city reference model: Assisting planners to conceptualize the building of smart city innovation ecosystems. *Journal of the Knowledge Economy*, 4 (2): 217-231.
- Regional Development Policy: <http://www.oecd.org/cfe/regional-policy/regionaldevelopment.htm>
- The European Union explained: Regional policy. Making Europe’s regions and cities more competitive, fostering growth and creating jobs. Luxembourg: Publications Office of the European Union, 2014.
- <http://mfe.gov.ro/minister/periode-de-programare/perioda-2021-2027/>
- <http://mfe.gov.ro/stadiul-absorbției-fondurilor-ue/>