

Smart City Projects in the Small-Sized Municipalities: Contribution of the Cohesion Policy

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Abstract

The paper focuses on the smart city concept implementation in the Czech Republic during 2007-2013. The aim is to deliver a closer look at the implementation of the concept in the conditions of the selected Czech municipalities by means of decoding the investments from the EU Cohesion policy. The municipalities represent small sized cities that have so far been on the periphery of interest in smart city debate as they are neither metropolises nor do they fit the newer concept of smart village. The analysed projects are divided into six smart city dimensions, the authors then explore investment intensity in relation to city size and its future commitment to become a smart city by means of having a formalized strategy. The results show that Czech municipalities invested into all smart city dimensions and infrastructure related projects prevailed. The larger the city the more intensive investment activity confirming the relation between size and absorption capacity. The divisive dimension that sets apart future smart cities is the investment into smart economy measures which were implemented in cities that later officially undertake the commitment of smartness.

Keywords

Cohesion Policy, Czech Republic, Municipalities, Public Sector, Smart City

JEL Classification

H72, O21, R58

Introduction

The regional development related activities take place at many levels of the regional and local governments using various tools that promote the development of territories. One such tool that has been discussed in practice and academia quite intensively in the last decade, and in some iterations even sooner, is the concept of a “smart city” (Komninos & Mora, 2018; Mora, Bolici, & Deakin, 2017). The concept itself is a complicated one lacking a common definition although having widely accepted dimension of connecting the development of cities to modern technologies and innovations (Cugurullo, 2018b).

This paper aims to add to the debate that has been ongoing most intensively and to deliver a closer look at the concept of smart city and its implementation in the conditions of the selected municipalities located in the Czech Republic. Previous research on smart cities has been focused mostly on large cities with hundreds of thousands and millions of inhabitants in Europe and European Union (Bakici, Almirall, & Wareham, 2013; Giffinger et al., 2007; Manville et al., 2014) or in the Americas (Alawadhi et al., 2012), later a concept of smart village emerged and examines approach to rural areas (Garai, Maity, Hossain, Roy, & Rana, 2017; Visvizi & Lytras, 2018). This leaves a gap for small sized countries, such as the Czech Republic, which contain municipalities that are by its function and layout cities in serving wider population with access to goods and services but by count of their population have not so far been in the centre of the debate on smart city. The size of such cities often means they have limited resources to invest into their development initiatives. Based on this limitation that the municipalities themselves face, the authors explore the implementation of the smart city concept in the Czech municipalities through projects funded from the European Union (EU) originating cohesion policy, the most prominent investment policy of the EU and similarly important as far as public investments in the Czech Republic are concerned (European Commission, 2018). The aim of the paper is to identify the projects implemented through the cohesion policy in the programming period 2007-2013 which can be connected to various dimensions of the smart city concept and find out whether even smaller city like municipalities, which are prevalent in the Czech Republic, have the ability to implement the concept of smart city via cohesion policy.

The paper is structured as follows: first part of the paper introduces the theoretical background of smart city

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concept, including its connection to the cohesion policy of the EU. In the next parts the methodology of research and its result are introduced and discussed. Last part contains the conclusions.

Literature Review

According to United Nations (2018) research, more than half of the world's population lives in an urban area with prediction of 68 % in the year 2050. In the EU circa 85% of population will live in cities in 2050 (Vinod Kumar & Dahiya, 2017). The urban environment offers a tremendous potential for influencing wider regional development and the subsequent quality of life of the population. The concept of smart city represents one of the approaches to influence these in connection with modern technologies and innovations. As mentioned previously, the smart city concept has an established history and in the last decade has been prominent among politicians and academics (Guo et al., 2019). The concept itself, however, is by no means universally defined. Albino, Berardi & Dangelico (2015) alone published paper with more than 20 collected smart city definitions from papers dated between 2000 and 2014. Cariguli et al. (2011) describe smart city as a quite fuzzy concept. As many others van Waart et al. (2016) point out that that smart city term has no generally agreed upon definition. Hall et al. (2000) were among the first who attempted to define a smart city. The vision they presented includes technological, environmental aspects as well as interconnecting modern technologies with emphasis on efficiency of the entire system. Since then, hundreds of expert studies and thousands of media reports have been published on the topic. The definition of the concept varies considerably with regards to the scientific, geographic and economic context with Mora, Bolici & Deakin (2017) distinguishing between the more technology oriented American branch of research and the holistic approach of European researchers. As the example of the latter approach, Caragliu, del Bo, & Nijkamp (2011) incorporate into their widely cited research on the definition of smart city the investments into both human capital, traditional infrastructure as well as the infrastructure of ICT with resulting improvements in sustainable economic growth and quality of life. At the same time, these authors include the need of environmental sustainability and participation of the citizens on governance. In this vein, Neirotti et al. (2014) agree that the technology and infrastructure alone does not constitute a smart city but emphasize other so called soft dimensions such as culture, education, social security, etc.

In this approach Neirotti et al. (2014) open another way of seeing a smart city, that is through its components or dimensions. This approach was used already in the early literature when Giffinger et al. (2007) proposed the six types of factors of a smart city – smart economy, smart people, smart governance, smart mobility, smart environment and smart living with the corresponding characteristics describing the competitiveness, social and human capital, participation, transport and ICT, natural resources and quality of life. Nevertheless, the six component approach has been echoed by Neirotti et al. (2014) themselves who suggest a classification of six domains - natural resources and energy, transport and mobility, buildings, living, economy and people, and government. There are also more concise approaches to the dimensions or components of smart city as represented by Nam & Pardo (2011) who described dimensions of technology, people and community. Similarly, Meijer & Bolívar (2016) in their literature review identified the components of technological focus, human resources focus, and governance focus. These shortened lists of dimension in no way implicate a narrower view of the smart city concept. In fact, when Meijer & Bolívar (2016) delve into more detailed explanation of technological focus they identified within their extensive literature review, they repeatedly mention ICT and its benefits, transport and other hard infrastructure. The human resources focus is oriented at people and human capital including education and quality of life, and finally the governance focus is characterized in terms of stakeholders and their interactions which presumably lead to connection of knowledge to action resulting in innovation.

With regards to the objective of implementing the smart city concept, it is aimed at finding the most effective solutions to the problems of urbanized spaces with the ambition to improve the quality of life while emphasizing the potential of modern digital technologies as a means to achieving that objective with the intensive cooperation of the community through participative governance. With regards to municipalities, Lee et al. (2014) highlight issues of public service quality, congestion, increase of the built-up space, environmental pollution, energy efficiency and other inequalities affecting the public space which the municipalities can influence to a degree that is different with each of these challenges.

The concept itself and its implementation certainly do have advantages and disadvantages attached as Angelidou (2014) points out. There are doubts about the measurable benefits and long-term sustainability of the whole concept and its implementation as evidenced by newly emerging studies (Cugurullo, 2018a; Taylor Buck & While, 2017; see e.g. Wiig, 2016). Nevertheless, smart city concept despite its lack of generally definition manages to evoke general understanding of a tool that is worth introduction and implementation across European and global large cities.

The relation between smart city concept and city size was mentioned by Neirotti et al. (2014) who suggest advantages and draw-back for both large sized cities and small cities in terms of implementation. Although the smart city concept was initially introduced and later studied in predominantly large cities, sometimes spilling into national-wide concept in rather small countries area-wise (Angelidou, 2014; Pellicer et al., 2013), the spread of ICT

and subsequent ease of implementing of some dimensions enables the concept to be introduced to smaller sized cities as well (Boulton, Brunn, & Devriendt, 2011; Formisano et al., 2015; Oliveira & Campolargo, 2015). It is on these relatively smaller and small cities where this research aims its focus.

The application of the smart city concept in the Czech Republic is currently a popular topic. In 2015 the Centre of Transport Research published a Methodology of Smart City Concept (Bárta, Martínek, Dostál, Mynařík, & Šmarda, 2015). Ministry of Regional Development certified the methodology and as such the document represents an official position on smart city concept implementation. Following, in 2019 a methodology co-authored by two of authors of this paper was certified focused on the smart governance dimension. Some municipalities of the Czech Republic have since produced strategic documents detailing their part to becoming a smart city. Such examples can be found in large cities such as the capital Prague, second largest city of Brno, third largest Ostrava or smaller municipalities ranging from eight to 100 thousand inhabitants. Among 205 municipalities which will later be analysed, some 52 have already produced or are in process of producing a strategy on becoming a smart city (Smékalová & Kučera, 2019).

The connection between smart cities and the EU cohesion policy is evident in the strategy Europe 2020 (European Commission, 2010). The strategy outlines a number of sectoral policies with focus on promoting new environmentally friendly technologies, science, research, social inclusion and competitiveness (Dobrovic, Gallo, Mihalcova, Stolfova, & Szaryszova, 2018; Terem, Čajka, & Rýsová, 2015). While “smart city” as a term is not explicitly mentioned in the document, the link, especially in relation to technological measures, is obvious. Europe 2020 Strategy represents one of main documents for the formulation of priorities for EU cohesion policy, the largest investment policy of the EU. As such the above mentioned emphasis on these measures is also reflected in the way the cohesion policy is implemented in individual Member States. And while this paper looks into projects implemented in earlier period of 2007-2013, in this period already the EU committed to studying, defining and supporting the concept as evidenced by the Smart Cities and Communities Initiative, a technology oriented initiative focused on meeting energy related objectives (European Commission, 2011) or mapping smart cities inside the EU (Manville et al., 2014).

The cohesion policy in 2007-2013 period which is the focus of this paper, presented municipalities with opportunities to find financial resources for their investments related to objectives of the policy itself, Lisbon Strategy and later launched Europe 2020 Strategy mentioned above (Bachtler & McMaster, 2008; Ferry & McMaster, 2005; Gajewski, 2017). In fact, as of March 2013 the municipalities and regions in the Czech Republic were beneficiaries to approximately 30 % of EU support allocated for 2007-2013 period (Hájek, Smékalová, Novosák, & Zahradník, 2014). Delivered through operational programmes, financed by several distinct funds at the level of the European Union, the policy was a major source of public investments in some EU Member States and continues to be so in present period (European Commission, 2018). As the public budget have been continually strained, especially so in times of global financial crisis, the policy presented a welcome opportunity enabling the municipalities investments in line with its purposes.

Research objective, methods and data

The aim of this paper is to present the implementation of smart city dimensions in the Czech municipalities through projects funded from the EU cohesion policy in 2007-2013. Though this is a period that predates the intensive interest in smart city, the authors presume the investments connected with its dimensions as defined by Giffinger et al. (2007) were already being introduced as results of close connection of the strategies implemented at the highest level of all EU policies including the cohesion policy. In essence investments made with aid from the cohesion policy may be classified as belonging into one of the six smart city dimensions with the thought that they are improving this particular dimension leading closed to a state of smartness.

The analysis of the projects funded from the EU cohesion policy in the 2007-2013 period is based on the list of projects published by the Ministry of Regional Development of the Czech Republic as required by the rules of the policy itself. The document contains information on more than 72,000 projects implemented in the period of interest. These projects were described with multiple attributes: a brief description of the project, title and number, funding operational programme, title and identification number of beneficiary, the institutional sector of the beneficiary, its legal form, budget and location. The first step was to identify the projects implemented by municipalities. This step was operationalized by selecting those projects that were implemented either by municipalities or by legal entities founded and owned by municipalities. The municipality founded and owned entities were mainly schools, municipal transport companies, municipal technical services and selected health and social service related entities. This reduced the number of projects to approximately 28 thousand.

These were the projects implemented by all municipalities in the Czech Republic, small and large alike. However, since the paper aims to focus on municipalities that are by its function and layout in terms of local population magnitude cities as seen in them serving wider population with access to goods and services but by count of their population have not so far been in the centre of the debate on smart city, a further reduction was necessary. In order to analyse such municipalities, the authors chose to work with cities that are centres on the micro-regional

level of the Czech Republic. These are called municipalities with extended powers in the Czech legislation. There are 205 such municipalities which serve to a wider region and contain almost half a population of the Czech Republic (Soukopová, Nemec, Matějová, & Struk, 2015). These municipalities differed widely in population during the period of interest, as of 2013 between 2,8 and 378 thousand of inhabitants. Most of them however, would not be considered large or even mid-sized cities from the Europe-wide point of view as the population of only four of them exceeded hundred thousand or more, 20 exceeded 50 thousand (Czech Statistical Office, 2013). The reduction on projects implemented by these municipalities resulted in database of 7,1 thousand projects.

The second step of analysis was to choose projects that were related to the concept of smart city. This step was operationalized by a combination of the following:

- 1) an analysis of the operational programme documents to identify the most likely programs which could fund such projects,
- 2) analysis of the titles and descriptions of the projects and connecting each project to a dimension of smart city it enhanced. The process was based on the theoretical background mentioned above and divided the projects among those related to smart economy, smart people, smart governance, smart mobility, smart environment and smart living as illustrated in Giffinger et al. (2007).

Next, the analysis focused on individual smart city dimensions and relation of investment amount and frequency of projects in relation to city size. Given the non-normal distribution of project number and total investment amount among the municipalities confirmed by Shapiro-Wilk test, non-parametric test of Spearman's rho was used to obtain the results.

In order to uncover whether there is a difference between the municipalities that would call themselves smart cities in present or future and have devised and/or applied strategies to that end, Man Whitney U test was used comparing per capita investments in all six smart city dimensions individually between the group of municipalities that proclaimed themselves on the path to smart city and those that did not.

Results and discussion

During the observed 2007-2013 period, the 205 municipalities with extended powers in the Czech Republic obtained CZK 98,8 billion, approximately € 3,8 billion, in 7,1 thousand approved projects. These were then divided into six abovementioned smart city dimensions as seen in table 1. The table indicates that the investments were particularly focused on the environment and living dimensions of smart city concept. More than due to the choice of the municipalities, this is a consequence of targeting various areas in order to meet EU regulations, especially with the environment oriented projects in mind. The Czech Republic, as many other newer Member States of the EU, used the Cohesion policy funding to improve compliance with the environmental legislature of the EU, a process that was and still is quite costly (Streimikiene, Klevas, & Bubeliene, 2007; Štreimikienė & Mikalauskiene, 2016; Toshkov, 2008). The increased investments seen to be aimed at the living dimension of smart city are in part due to rather broad area this dimension encompasses and in part due to investments into public spaces, sports, cultural and other facilities frequently owned by the municipalities. These were long underfinanced in the Czech Republic and the cohesion policy presented an opportunity to improve this situation (Jahoda, Šelešovský, & Peková, 2006). Mobility investments were quite costly per project and included investments into infrastructure of municipal roads and transport systems. Governance dimension comprised of investments into municipal ICT systems, strategic and land use planning, social services provided directly by the municipalities, education of the civil servants. There was, unfortunately, little evidence of investments into participative processes, rather the investments frequently aimed at improving the transparency of decision-making. Investments into people were focused on municipality provided educational services both in terms of quality and in terms of capacity of the educational facilities. The smallest amount of investment was directed at economy dimension. This comprised of creating business incubators and industrial zones. A matter, that is in majority of cases not in the hands of municipalities but rather handled by NUTS 3 regions of agencies with national-wide scope. While the entrepreneurs in the Czech Republic generally consider the assistance of municipalities as insufficient (Macháček, 2017) and the administrative barriers as daunting (Belas, Belas, Cepel, & Rozsa, 2019; Kljucnikov & Sobekova Majkova, 2016; Kozubikova, Kotaskova, Dvorsky, & Kljucnikov, 2019), it must be said there is an interconnectedness of investments and ones made in one dimensions may positively influence other as is the case of mobility investments improving both entrepreneurial conditions and environmental ones (Chen, Ardila-Gomez, & Frame, 2017).

The overall prevalence of infrastructural investment may suggest that the municipalities may later associate the smart city concept especially with modern technologies as is the case especially in rural and peripheral regions (Desdemoustier, Crutzen, & Giffinger, 2019). However, given the finding on European smart city initiatives reported by Neirotti et al. (2014), they are not surprising as these authors also found high activity in these areas. On the other hand, they also report many activities concerning smart economy, which is not yet the case in the Czech Republic on the level of municipalities.

Table 1. Project distribution among smart city dimensions.

Smart city dimension	Economy	People	Governance	Mobility	Environment	Living
No. of project	16	1 581	1 273	423	2 603	1 243
Mil. € invested	18,7	169,1	197,4	513,8	1 328,7	1 576,3
Smart city dimension	16	1 581	1 273	423	2 603	1 243

Source: Ministry of Regional Development of the Czech Republic 2016; author's calculations

In closer look at the individual smart city dimensions, the correlations were calculated to find out whether there is a significant relationship between the size of municipalities and number of projects or amount of investments (details in table 2). The results indicate, that there is indeed a positive correlation between the size of municipality involved and the number of projects in all smart city dimensions with the exception of economy dimension which was in itself very sparingly represented. The same is valid for number of projects. The highest positive correlation was found between the size of city and number of projects in people and living dimensions. In terms on amount invested, the relationship was particularly strong with regards to living, governance, and environment dimensions. Indicating that the larger municipalities have larger absorption and administrative capacities to proceed with these investments.

Table 2. Correlation coefficient, correlation to population size.

Smart city dimension	Economy	People	Governance	Mobility	Environment	Living
No. of project	,244	,777**	,475**	,473**	,423**	,640**
Mil. € invested	,088	,492**	,597**	,552**	,585**	,634**
Smart city dimension	,244	,777**	,475**	,473**	,423**	,640**

** Correlation is significant at the 0.01 level (2-tailed).

Source: Ministry of Regional Development of the Czech Republic 2016; author's calculations

The authors also attempted to uncover a possible relationship between these early investments and a latter tendency to achieve the status of a smart city formalized by an existing strategic documents that would detail the process of becoming a smart city on the level of municipal strategic planning. Such documents were in 2019 in force or in stages of preparation in 52 out of the 205 municipalities.

The attempt was to distinguish whether there is a significant difference in smart city dimensions investments per capita between the cities with and without such a strategy. The Mann Whitney U test indicated that there are some differences in mean ranks. The only statistically significant result was noted in per capita investment in economy dimension. The municipalities who later declared themselves to be on path to being a smart city invested into economic dimension rather more intensively proving a deeper understanding to the importance of this particular dimension. Aside from that, while statistically insignificant, the results indicated larger per capita investment on part of these smart city bound municipalities to living and mobility dimensions, lesser into environment and rather similar into governance and people.

Conclusion

The smart city concept is currently a pertinent part of academic and political debate and the interest in understanding the concept and its implementation is continuing worldwide (Guo et al., 2019; Neirotti et al., 2014). This contribution aimed at a more detailed look on the nascent implementation of the concept in the Czech Republic where selected municipalities have taken the step to formalize their commitment to becoming smart cities quite recently (Smékalová & Kučera, 2019). The cities of the Czech Republic, however, are mostly rather small from European let alone global point of view and as such have been so far on the periphery of debate on smart cities which concentrates on cities of larger size. Therefore, this paper aimed to add to the debate on smart city and its implementation by a detailed look on investments made towards its dimensions as defined by Giffinger et al. (2007) in selected Czech municipalities. The focus was on period 2007-2013 and the investments made with the aid of Cohesion policy of the EU, a most prominent investment policy of this organization. Limits of the research are given mainly by the selection of municipalities which was based on administrative division of the Czech Republic and thus may have omitted such municipalities that are committed to becoming a smart city, yet not parts of this administrative structure.

The results indicate that in the period of interest 205 municipalities that serve as micro-regional centres in the Czech Republic made multitude of investment into all six smart city dimensions with notably strong investments into infrastructure especially connected with environment and living dimensions owing to the previous

underfunding of these situation (Jahoda et al., 2006) and the necessity to comply with EU legislature (Streimikiene et al., 2007; Štreimikienė & Mikalauskiene, 2016; Toshkov, 2008). Smallest investments were made in dimension of smart economy indicating that the municipalities perhaps have yet identified this part of smart city approach as important. However, the investment in smart economy dimension were the factor that significantly distinguished those cities, that later formalized their efforts to become a smart city by a strategic document. This suggest that the Czech municipalities were concentrated on infrastructure investments and they might use the concept of smart city to further these investments rather than investments into soft human resources, governance and participatory measures thus not fully grasping all that is encompassed in the label “smart city”. This, too, presents an opportunity for further research that can focus on investments in the present period of cohesion policy 2014-2020. This period, too has offered substantial monetary resources for municipal investments which were used to point many a city on path towards smartness. Early overviews of the projects so far indicated an increased interest in community and transparency oriented project which may help deepen the understanding of smart city as a broader than technological concept. However, with the EU Cohesion policy focusing on green, sustainable, inclusive and competitive economy, the efforts and investments going into improving the mobility and environmental aspects of smart cities are likely to remain extensive as well. Alongside the analysis of newer period, further research concerning the understanding of smart city as a concept by the municipal officials and public servants is also in order as these individuals and collective bodies effectively decide whether a city will undertake the commitment to be smart and what path to achieve the goal is taken.

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References

- Alawadhi, S., Aldama-Nalda, A., Chourabi, H., et al. (2012). Building Understanding of Smart City Initiatives. In International Conference on Electronic Government (pp. 40-53).
- Albino, V., Berardi, U., & Dangelico, R. M. (2015). Smart Cities: Definitions, Dimensions, Performance, and Initiatives. *Journal of Urban Technology*, 22(1), 3-21. <https://doi.org/10.1080/10630732.2014.942092>.
- Angelidou, M. (2014). Smart City Policies: A Spatial Approach. *Cities*, 41, S3-S11. <https://doi.org/10.1016/j.cities.2014.06.007>.
- Bachtler, J., & McMaster, I. (2008). EU Cohesion Policy and the Role of the Regions: Investigating the Influence of Structural Funds in the New Member States. *Environment and Planning C: Government and Policy*, 26(2), 398-427. <https://doi.org/10.1068/c0662>.
- Bakici, T., Almirall, E., & Wareham, J. (2013). A Smart City Initiative: The Case of Barcelona. *Journal of the Knowledge Economy*, 4(2), 135-148. <https://doi.org/10.1007/s13132-012-0084-9>.
- Bárta, D., Martínek, J., Dostál, I., Mynařík, J., & Šmarda, P. (2015). *Metodika Konceptu inteligentních měst*. Brno: Ministry of Regional Development of the Czech Republic.
- Belas, J., Belas, L., Cepel, M., & Rozsa, Z. (2019). The Impact of the Public Sector on the Quality of the Business Environment in the SME Segment. *Administratie Si Management Public*, 2019(32), 18-31. <https://doi.org/10.24818/amp/2019.32-02>.
- Boulton, A., Brunn, S. D., & Devriendt, L. (2011). Cyberinfrastructures and ‘Smart’ World Cities: Physical, Human and Soft Infrastructures. In International Handbook of Globalization and World Cities (pp. 198-206).
- Caragliu, A., Del Bo, C., & Nijkamp, P. (2011). Smart Cities in Europe. *Journal of Urban Technology*, 18(2), 65-82. <https://doi.org/10.1080/10630732.2011.601117>.
- Chen, Y., Ardila-Gomez, A., & Frame, G. (2017). Achieving Energy Savings by Intelligent Transportation Systems Investments in the Context of Smart Cities. *Transportation Research Part D: Transport and Environment*, 54, 381-396. <https://doi.org/10.1016/j.trd.2017.06.008>.
- Cugurullo, F. (2018a). Exposing Smart Cities and Eco-Cities: Frankenstein Urbanism and the Sustainability Challenges of the Experimental City. *Environment and Planning A: Economy and Space*, 50(1), 73-92. <https://doi.org/10.1177/0308518X17738535>.
- Cugurullo, F. (2018b). The Origin of the Smart City Imaginary: From the Dawn of Modernity to the Eclipse of Reason. In Routledge Companion to Urban Imaginaries (pp. 113-124).
- Czech Statistical Office. (2013). *Population of Municipalities - 1 January 2013* [online]. Czech Statistical Office. Available at: <https://www.czso.cz/csu/czso/pocet-obyvatel-v-obcich-k-112013-nxf2b249sf> [Accessed 22. 11. 2018].
- Desdemoustier, J., Crutzen, N., & Giffinger, R. (2019). Municipalities’ Understanding of the Smart City Concept: An Exploratory Analysis in Belgium. *Technological Forecasting and Social Change*, 142, 129-141. <https://doi.org/10.1016/j.techfore.2018.10.029>.
- Dobrovic, J., Gallo, P., Mihalcova, B., Stolfova, L., & Szaryszova, P. (2018). Competitiveness Measurement in Terms of the Europe 2020 Strategy. *Journal of Competitiveness*, 10(4), 21-37. <https://doi.org/10.7441/joc.2018.04.02>.
- E. Hall, R., et al. (2000). The Vision of a Smart City. In 2nd International Life Extension Technology Workshop (pp. 1-6).
- European Commission. (2010). *Europe 2020* [online]. European Commission. Available at: [http://ec.europa.eu/eu2020/pdf/COMPLET EN BARROSO 007 - Europe 2020 - EN version.pdf](http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20007%20-%20Europe%2020%20-%20EN%20version.pdf) [Accessed 01. 10. 2018].
- European Commission. (2011). *Report of the Public Consultation on the Smart Cities and Communities Initiative*. Brussels: Directorate-General for Energy.
- European Commission. (2018). *% of Cohesion Policy Funding in Public Investment per Member State* [online]. European

- Structural and Investment Funds. Available at: <https://cohesiondata.ec.europa.eu/Other/-of-cohesion-policy-funding-in-public-investment-p/7bw6-2dw3> [Accessed 20. 11. 2018].
- Ferry, M., & McMaster, I. (2005). Implementing Structural Funds in Polish and Czech Regions: Convergence, Variation, Empowerment? *Regional and Federal Studies*, 15(1), 19-39. <https://doi.org/10.1080/13597560500084046>.
- Formisano, C., Pavia, D., Gurgen, L., et al. (2015). The Advantages of IoT and Cloud Applied to Smart Cities: ClouT User Scenarios and Reference Architecture. In 3rd International Conference on Future Internet of Things and Cloud (pp. 325-332).
- Gajewski, M. (2017). Policies Supporting Innovation in the European Union in the Context of the Lisbon Strategy and the Europe 2020 Strategy. *Comparative Economic Research*, 20(2), 109-127. <https://doi.org/10.1515/cer-2017-0015>.
- Garai, R., Maity, P., Hossain, R., Roy, P., & Rana, T. K. (2017). Smart Village. In 1st International Conference on Electronics, Materials Engineering and Nano-Technology (pp. 1-6).
- Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Milanović, N., & Meijers, E. (2007). *Smart Cities Ranking of European Medium-Sized Cities*. Vienna: Vienna University of Technology.
- Guo, Y. M., Huang, Z. L., Guo, J., Li, H., Guo, X. R., & Nkeli, M. J. (2019). Bibliometric Analysis on Smart Cities Research. *Sustainability*, 11(13), 3606. <https://doi.org/10.3390/su11133606>.
- Hájek, O., Smékalová, L., Novosák, J., & Zahradník, P. (2014). Spatial Coherence of National and European Regional Policy: The Insights from the Czech Republic and Slovakia. *Politická Ekonomie*, 62(5), 630-644.
- Jahoda, R., Šelešovský, J., & Peková, J. (2006). Building Fiscal Capacities in the Czech Republic. In Local Government Financial Capacity Building in Transition Countries: Selected Country Studies (pp. 43-61).
- Kljucnikov, A., & Sobekova Majkova, M. (2016). Impact of Gender in the Perception of Administrative Burdens among Young Entrepreneurs - Evidence from Slovakia. *Journal of Competitiveness*, 8(2), 17-30. <https://doi.org/10.7441/joc.2016.02.02>.
- Komninos, N., & Mora, L. (2018). Exploring the Big Picture of Smart City Research. *Scienze Regionali*, 17(1), 15-38. <https://doi.org/10.14650/88815>.
- Kozubikova, L., Kotaskova, A., Dvorsky, J., & Kljucnikov, A. (2019). The Impact of Political Factors' Perception on Suitability of International Business Environment: The Case of Startups. *Economics and Sociology*, 12(1), 61-79. <https://doi.org/10.14254/2071-789X.2019/12-1/3>.
- Lee, J. H., Hancock, M. G., & Hu, M. C. (2014). Towards an Effective Framework for Building Smart Cities: Lessons from Seoul and San Francisco. *Technological Forecasting and Social Change*, 89, 80-99. <https://doi.org/10.1016/j.techfore.2013.08.033>.
- Macháček, J. (2017). Promoting Entrepreneurship on the Part of Municipalities. *Administratie Si Management Public*, 2017(29), 74-90.
- Manville, C., et al. (2014). *Mapping Smart Cities in the EU*. Brussels: European Union.
- Meijer, A., & Bolívar, M. P. R. (2016). Governing the Smart City: A Review of the Literature on Smart Urban Governance. *International Review of Administrative Sciences*, 82(2), 392-408. <https://doi.org/10.1177/0020852314564308>.
- Ministry of Regional Development of the Czech Republic. (2016). *List of Beneficiaries 06/2016*. [online]. DotaceEU. Available at: <https://dotaceeu.cz/cs/Evropske-fondy-v-CR/Programove-obdobi-2007-2013/Cerpani-v-obdobi-2007-2013> [Accessed 08. 09. 2018].
- Mora, L., Bolici, R., & Deakin, M. (2017). The First Two Decades of Smart-City Research: A Bibliometric Analysis. *Journal of Urban Technology*, 24(1), 3-27.
- Nam, T., & Pardo, T. A. (2011). Conceptualizing Smart City with Dimensions of Technology, People, and Institutions. In 12th Annual International Digital Government Research Conference on Digital Government Innovation in Challenging Times (pp. 282-291).
- Neirotti, P., De Marco, A., Cagliano, A. C., Mangano, G., & Scorrano, F. (2014). Current Trends in Smart City Initiatives: Some Stylised Facts. *Cities*, 38, 25-36. <https://doi.org/10.1016/j.cities.2013.12.010>.
- Oliveira, Á., & Campolargo, M. (2015). From Smart Cities to Human Smart Cities. In Proceedings of the Annual Hawaii International Conference on System Sciences (pp. 2336-2344).
- Pellicer, S., Santa, G., Bleda, A. L., Maestre, R., Jara, A. J., & Skarmeta, A. G. (2013). A Global Perspective of Smart Cities: A Survey. In 7th International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (pp. 439-444).
- Smékalová, L., & Kučera, F. (2019). *Strategic Management Analysis in Selected Municipalities in Context of Smart City and Smart Governance Approach. Report for Project TATJ01000114 Applying Smart Governance Approaches to Organizational Structures of the Municipalities in the Czech Republic*. Zlín: Tomas Bata University in Zlín.
- Soukopová, J., Nemeč, J., Matějová, L., & Struk, M. (2015). Municipality Size and Local Public Services: Do Economies of Scale Exist? *NISPAcee Journal of Public Administration and Policy*, 7(2), 151-171. <https://doi.org/10.2478/nispa-2014-0007>.
- Streimikiene, D., Klevas, V., & Bubeliene, J. (2007). Use of EU Structural Funds for Sustainable Energy Development in New EU Member States. *Renewable and Sustainable Energy Reviews*, 11(6), 1167-1187. <https://doi.org/10.1016/j.rser.2005.07.006>.
- Štreimikienė, D., & Mikalauskienė, A. (2016). Green Growth and Use of EU Structural Funds in Baltic States, Czech Republic and Slovakia. *E a M: Ekonomie a Management*, 19(2), 55-72. <https://doi.org/10.15240/tul/001/2016-2-004>.
- Taylor Buck, N., & While, A. (2017). Competitive Urbanism and the Limits to smart City Innovation: The UK Future Cities Initiative. *Urban Studies*, 54(2), 501-519. <https://doi.org/10.1177/0042098015597162>.
- Terem, P., Čajka, P., & Rýsová, L. (2015). Europe 2020 Strategy: Evaluation, Implementation, and Prognoses for the Slovak Republic. *Economics and Sociology*, 8(2), 154-171. <https://doi.org/10.14254/2071-789X.2015/8-2/12>.
- Toshkov, D. (2008). Embracing European Law. *European Union Politics*, 9(3), 379-402.
- United Nations. (2018). *World Urbanization Prospects 2018* [online]. World Urbanization Prospects. Available at: <https://population.un.org/wup/Publications/> [Accessed 15. 10. 2018].
- van Waart, P., Mulder, I., & de Bont, C. (2016). A Participatory Approach for Envisioning a Smart City. *Social Science*

Computer Review, 34(6), 708-723.

Vinod Kumar, T.& Dahiya, B. (2017). *Smart Economy in Smart Cities*. Singapore: Springer.

Visvizi, A., & Lytras, M. (2018). It's Not a Fad: Smart Cities and Smart Villages Research in European and Global Contexts. *Sustainability*, 10(8), 2727. <https://doi.org/10.3390/su10082727>.

Wiig, A. (2016). The Empty Rhetoric of the Smart City: From Digital Inclusion to Economic Promotion in Philadelphia. *Urban Geography*, 37(4), 535-553. <https://doi.org/10.1080/02723638.2015.1065686>.