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Economy-Region-Society

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Introduction

The journal "Strategic Issues of Northern Hungary:Economy-Region-Society" represents the main academic voice of professionals from Northern Hungary dedicated tostudying the complex interrelationshipbetween economy, society and their regional context. From time to time the journal publishes English contributions in order to create an opportunity for the professional community of the region to disseminate its main scientific contributionsona larger scale. Therefore, this issue contains nine contributions from the broader field of regional economics and management. The spatial focus of the studies is very broad and partially reflects the institutional background of the contributors: from Northeastern Hungary (addressing business consulting, A. Tokár-Szadai) to Central Transylvania. Three studies cover the country level (one for Hungary and two for Romania). One study focuses on the city level, measuring the "five-minute" distances to different urban facilities in Cluj/Kolozsvár (O. Nagy and B. Păcurar). Moreover, we have two theoretical studies, one dedicated to the global issue of raw materials (B. Varga and K. Fodor), the second for the analysis of the interconnections between entrepreneurship and economic growth (A. Gubik and Aku-SikaBuah).

From the thematic point of view two studies deal with the question of regional innovation: one points out the regional effects of the innovation process (F. Schenk), while the second offers the evaluation of the regional innovation potential (D. Szendi). The regional dimension is crucial for the paper addressing the issue of district heating companies, as well (G. Süveges).

A distinct group of papers questionsdevelopment strategies: regional and local tourism development stratgies in Romania (A. Talpoș) and smart specialization (P. Szavics), both at the heart of European and national policies.

April 2020

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STUDIES

Süveges, Gábor Béla

Regional Characteristics of Hungarian District Heating Companies Based on their 2009-2017 Financial Reports, with Special Regard to the Rate of Accounts Receivable and to the Energy Efficiency of Household Consumers

This study examines specificities in the asset structure of district heating companies in Hungary, with special regard to the accounts receivable. The author wants to find out whether geographical position and the socio-economic conditions of the household consumers have a significant effect on the companies' rate of accounts receivable. In addition, the paper examines how energy efficiency can be described in the case of household consumers of heat suppliers. Its methodology is the analysis of financial reports. Using the data derived from the reports of heat supply companies in Hungary, 72 companies in all, and the technical and economic information, data from 9 years (2009-2017) were examined. District-level LHDI was also calculated to describe the characteristics of household consumers.
Keywords: district heat supply, analysis of financial report, local (district level) HDI, accounts receivables, energy efficiency
JEL code: K 132

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Introduction

Nowadays in Hungary, district heating is provided by 89 companies in 93 settlements, which supply more than 1.6 million people with heat. There are, however, differences in their ownership background, in the technical structure, in the activities carried out and in the number of supplied consumers of the district heat producers. The author hopes to reveal the characteristics that lead to the diverse assets, financial and profitability positions of these companies. In earlier research, factors were revealed that led to diverse assets, financial and profitability positions of these companies resulting from legal changes related to heat suppliers and from technical and economic characteristics. The current paper first focuses on the relationship between the socio-economic characteristics of household consumers and the asset structure of the district heat suppliers through the analysis of the share of accounts receivables to the total assets, as the economic and social positions of consumers has an effect on their solvency. The household fee payers' solvency can also determine the extent to which consumers can contribute to the development aiming at the improvement of energy efficiency(like the self-contribution for investments for the realization of a building renovation program or for the installation of heating metering). This leads to the second research question about testing the relationship between the socio-economic characteristics of household consumers and the efficient energy use of the population. To answer the outlined research questions, in the first part of the study the basic methodology is briefly summarized for the analysis of the asset structure and for the Hungarian situation of the heat suppliers, taking into account the regional differences in the consumers' socio-economic characteristics. Then, the results of the empirical research are described and discussed.

Toolkit necessary for analyzing current assets

In order to achieve and control a company's goal and its stakeholders'goals, information is needed (Mabberley 1999). Due to its fixed set of rules, accounting is suitable to realize communication among the various economic operators and to provide the requested information. Pál (2015, pp.14) says that "modern accounting is the language of business and the basic form of business communication as it forms a specific 'grammar'" that allows for the identical interpretation of economic processes by all actors.

Economic analysis can be considered as one of the basic methods of obtaining the necessary information. In the course of the analysis, we reveal relationships and factors influencing economic phenomena; therefore, the analysis can rightly be considered as a way of understanding, which not only facilitates but also ensures the acquisition of the necessary information(Kresalek 2011). The data presented in the reports provide an opportunity to get to know the company, as "financial indicators reflecting the realization of financial goals can be used to reveal the company's economic position and to understand the managerial, causal, market and other kinds of relationships"(Sinkovics 2010, pp. 125).

Examination of the balance sheet provides an opportunity to analyze the company's financial position. Depending on the depth and approach of the analysis, the comprehensive analysis of the balance sheet and a detailed examination of the individual/different balance sheet items can be distinguished (Pucsek 2011).

Table 1 includes calculation methods for a comprehensive asset analysis.

Table 1:
Calculation methods of asset structure indicators

Focus of the analysis / Indicator name		Calculation of the indicator	
		Numerator	Numerator
Indicators of asset structure	General way of calculating the indicator	Asset item	Asset group
	Examples	Fixed assets	Total assets
		Tangible asset	Total assets
		Current asset	Total assets

Source: Kardos et al. 2007; Siklósi-Veress 2016; Kresalek-Pucsek 2016, Musinszki 2015

In vertical analysis, we can understand the asset structure, the capital structure and their changes by calculating different distribution ratios (Molnár et al. 2018). The study tries to find the factors explaining the share of receivables rendered to clients. The term 'receivables rendered to clients' refers to the balance sheet item called 'Receivables from goods and service rendered to clients' specified in the Act on Accounting, accepting the legal definition that all the receivables performed by the entrepreneur, derived from goods and services that are not receivables from a related undertaking or from companies in other participating relations and that are not loans made in the long run shall be recognized here (Act C of 2000 on Accounting).

Importance of district heating

Consumers of Hungarian district heat suppliers

In Hungary, district heating has 677,000fee payers in 93 settlements, of which 657,000 are households and 20,000 are other fee payers. Figure 1 shows the evolution of the number of consumers between 2009 and 2017. In recent years, there has been no significant change for either households or other fee payers. Although there has been an increase in the construction of

new homes in recent years, its effect is only slightly reflected in the change of the number of fee payers. Research about district heat suppliers is relevant because of the high number of consumers and therefore the significant social involvement.

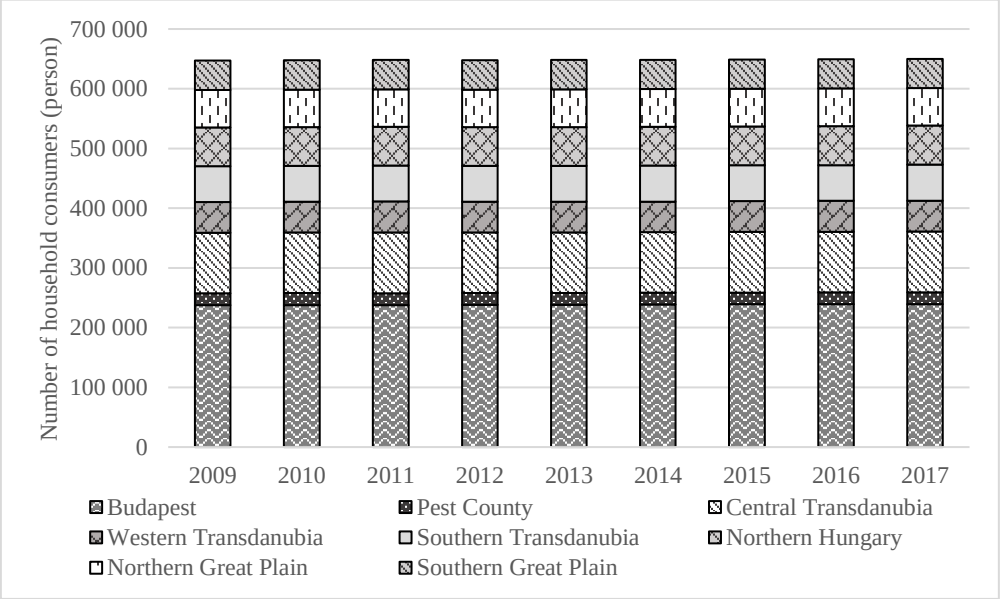

Figure 1: Number of household fee payers, 2009-2017
Source: Own edition based on HCSO data

There are regional disparities in the number and proportion of apartments supplied with district heating. Heat supply is widespread mainly in Budapest, in county seats and in settlements with more than 40,000 inhabitants (due to size management considerations). Differences can be observed not only in the number of district heat consumers, but also in the income conditions of household consumers, since social and economic inequalities at the regional level can be considered as a characteristic of the economies (Nemes Nagy, 1990). Just as geographical factors play a role in economic development (Benedek, 2019), the income conditions, the social status and employment conditions of household consumers using district heating can also affect the operation of district heating companies. Lower-income consumers are more likely to experience payment problems or delay payment of fees in the case of an unexpected problem and this can directly affect the profit, the profitability and the accounts receivable of service companies. There has been a shift towards lower-income consumers for household customers of heat suppliers. The distribution of households by type of heating per income deciles is shown in Figure 2. The income statistics of the Hungarian Central Statistical Office (HCSO) for 2017 highlight that district heating was present in an average of 16.9% of households in 2017 (compared to 15.9% in 2011). Figure 2 shows that a higher proportion of residents with higher income levels live in apartments with district heating than those with lower income levels.

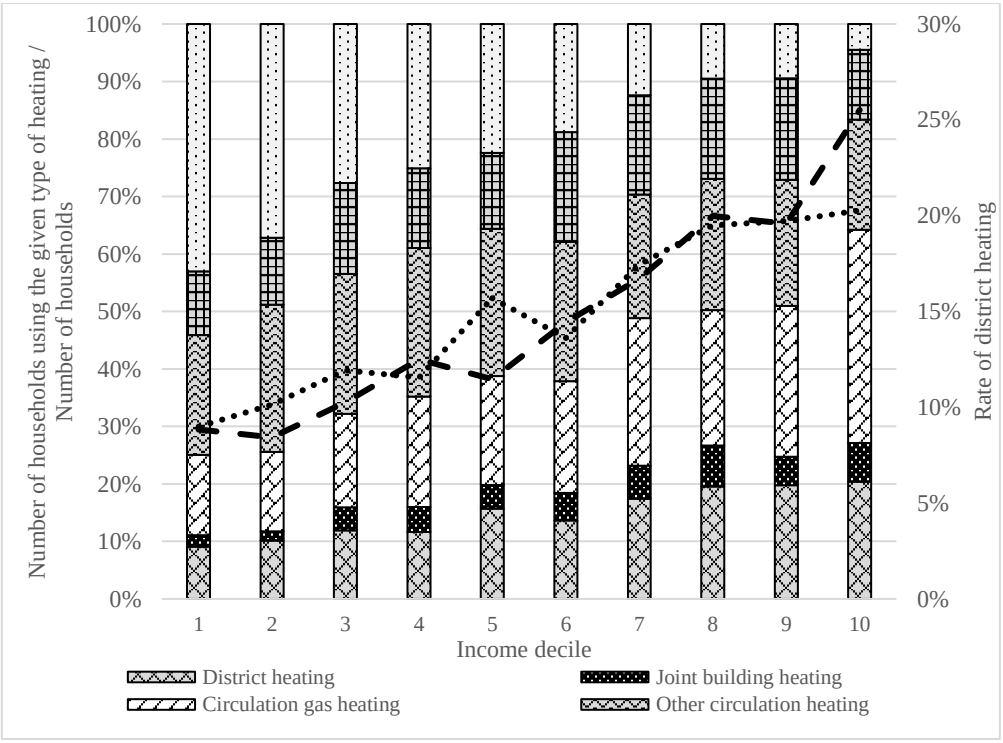

Figure 2: Distribution of households by type of heating by income deciles in 2017
Source: Own edition based on HCSO data

The two line graphs belonging to the secondary vertical axis highlight that there was some shift compared to 2011: the rate of district heating has decreased in the upper income decile, but the rate of consumers using district heating increased in four of the five lower deciles, which led to a decrease in the range and standard deviation of the rate of consumers in the different income deciles compared to 2011.

Another feature of district heating consumers is derived from spatial inequalities (Benedek and Kocziszky, 2017). To quantify and integrate them into a model, I downloaded district level data from the HCSO database for the period between 2009 and 2017 (there were several changes in the regional structure of Hungary; therefore, it was necessary for example to convert micro-regional level data to district level data). The variables describing household consumers were the following: Number of recipients of social support per capita, Number of jobseekers per capita, Per capita activity rate, Per capita personal income tax base.

When analyzing the performance of countries and regions (and of their inhabitants), besides economic factors, the use of other indicators (besides GDP-based mainstream analyses) is also justified. In order to properly describe the household consumers of district heat suppliers, I use a more complex indicator in addition to the simple variables described above and the economic characteristics of the consumers. Therefore I calculated a district-level Human Development Index (HDI)for 2011 and 2016. One such indicator is the LHDI (Local Human Development Index), which is based on the methodology and idea of the HDI. Szendi (2015) summarizes the emergence and development of the HDI as an indicator developed by the United Nations in 1990 and describes the development and evolution of the dimensions taken into account in its calculation over the past 30 years. She also describes the calculations made in recent years for territorial (regional, county, micro-regional) HDI calculations, including the cases of Brazil,

Russia, Portugal, Iran, Latvia, and Germany (Szendi, 2015). Similarly, my calculations applied the methodology of the 2013 United Nations Development Program (UNDP)elaborated for Poland (UNDP, 2013).

Based on these studies, I calculated the value of the LHDI for 2011 and 2016 as follows:

$$LHDI = \sqrt[3]{HI * EI * WI},$$

where LHDI is the local HDI of the given district, HI is the health component of the given district, EI is the education component of the given district, and WI is the welfare component of the given district.

In the calculation of HI (health component), life expectancy at birth was taken into account and the following relationship was used[1]:

$$HI = 1 + 99 * \frac{HI_i - HI_{min}}{HI_{max} - HI_{min}},$$

where HI_i is the value of life expectancy at birth in district, while HI_{max} and HI_{min} represent the maximum and minimum values of life expectancy at birth.

In the calculation of EI (education component), the geometric mean of two indicators were taken into account: the rate of residents having completed at least 8 grades of school among the population aged 15 and over and the rate of persons aged 25 and over with a tertiary education degree. Taking them into account, I used the following equation[2]:

$$EI = \sqrt[2]{(1 + 99 * \frac{LEI_i - LEI_{min}}{LEI_{max} - LEI_{min}}) * (1 + 99 * \frac{HI_i - HI_{min}}{HI_{max} - HI_{min}})},$$

where LEI_i is the proportion of residents having completed at least 8 grades of school among the population aged 15 and over, and LEI_{max} and LEI_{min} are the minimum and maximum rate of residents having completed at least 8 grades of school among the population aged 15, HI_i is the rate of persons aged 25 and over with tertiary education in district i, while HI_{max} and HI_{min} are the minimum and maximum rates of persons aged 25 and over with tertiary education in district i.

When calculating WI (welfare component), the calculations are based on the per capita personal income tax base and the following equation is applied[3]:

$$HI = 1 + 99 * \frac{WI_i - WI_{min}}{WI_{max} - WI_{min}},$$

where WI_i is the per capita personal income tax base in district i, while WI_{max} and WI_{min} represent the per capita personal income tax base in the districts.

The values of LHDI calculated for districts using this methodology are shown in Figure 3.

[1] Data for life expectancy at birth at the micro-regional level for 2011 was available from the 2010 Census. I used the 2016 data from the Microcensus data sources, which were collected at county level. In order to ensure that the data are comparable and could be used in the following analysis, two steps were needed: (1) I transformed the micro-region data for 2011 in accordance with the districts valid in 2016, since I deal with district heat suppliers at the district level, too, and (2) I transformed county-level data from 2016 to district level data, assuming that the change in the direction and the extent of life expectancy at birth in each district of a given county were the same as in that county.

[2] When calculating the two components of the education component, the data sources of the Census and the Microcensus were used, following similar steps as described above.

[3] I used TEIR (National Spatial Development and Spatial Information System) data to calculate the personal income tax base.

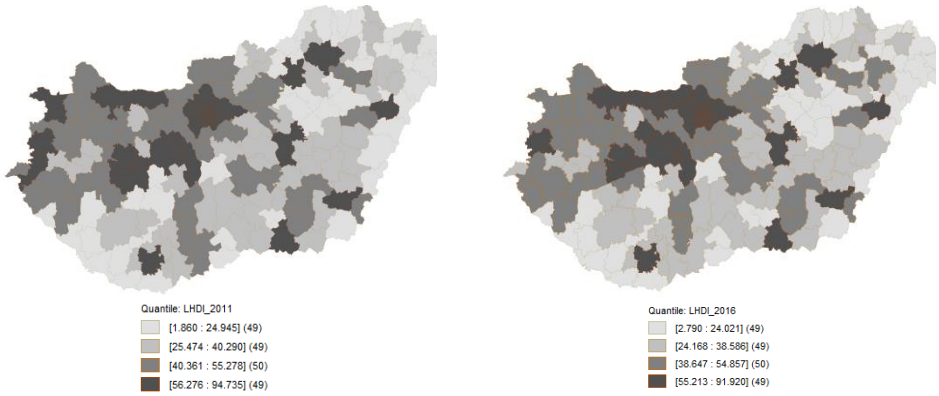

Figure 3: LHDI at the district level in 2011 and 2016
Source: Own edition based on HCSO data

The calculated data highlight that there are territorial disparities in LHDI values at the district level, with higher values in county seats and towns with county rank, and that territorial disparities did not decrease in the examined period (there were no significant change in the average and county level average values of LHDI and in their standard deviation). Moreover, it was the income component of LHDI that rose to the highest extent. The empirical part of the research examines the impact of the positive effects of the income and socio-economic situation of the population on the change in the rate of accounts receivables.

The role of district heat suppliers in energy policy

Energy is vital for life and used in many areas in our everyday lives, including heating, lighting, transport or industry. "Human well-being, industrial competitiveness and the functioning of the society as a whole depend on secure, reliable, sustainable and affordable energy" (European Committee, 2011). For this reason, proper management of energy sources is essential. The European Union Energy Strategy, elaborated based on these principles, set different targets for climate and energy policy for 2020, 2030 and 2050 (European Committee, 2012). Renewable energy sources play an important role in the energy strategy. The objective for 2020 is that 20% of the total energy will come from renewable energy sources. By 2030, the rate of renewable energy sources shall reach 32% and by 2050, it shall reach 55% (European Commission, 2018). The energy policy emphasizes sustainable, affordable, competitive and secure energy supply. Because of scarce resources, rational and efficient energy management can make its use sustainable. Achieving the targets will have a significant impact on applied technologies, as the rate of used resources will change fundamentally, and also because of the rising cost of fossil energy sources. These targets and the efforts made to achieve them can also be regarded as catalysts for the spread and development of technologies using renewable energy. Jensen (2019) states that low-temperature heat suppliers based on green and renewable energy sources play a key role in this. Djorup and Hvelplund (2016) point out their statement more categorically, arguing that a common European Energy System and efficient heat supply are essential to achieve the goals. If the targets are met, the benefits will be multiple: not only can carbon emissions be reduced, but new jobs can also be created and cost saving can be realized (European Committee, 2012).

It is worth noting how these principles are present in the law called Act XVIII of 2005on District Heating Services, the most important element of the regulation of district heat suppliers in Hungary. The objectives of the legislation are described as follows: "The Parliament makes the law to ensure objective, transparent and non-discriminatory regulations to ensure the safe, adequate and economical supply of district heating of customers, taking into account the

requirements of consumer protection, energy efficiency, energy saving and environmental protection' (Act XVIII of 2005 on District Heating Services).

The question arises as to which indicators can be used to measure the realization of energy efficiency and energy saving principles listed as aims of the law and what characteristics can be used to describe household consumers. This provides relevance to the second research question.

Material and method - Empirical study of district heat suppliers

Database of the analysis

The database used for the analysis includes the companies' annual reports from 2009 to 2017. Nowadays in Hungary, 89 companies provide district heating service in 93 settlements. Of these, 72 companies were included in the examined population.

The calculation of the indicators required the (annual) reports of the companies, which were considered the first type of data. The second type of the examined data was made up of technical and economic data provided annually by the companies under Annex 4 of Government Decree no. 157/2005 (August 15) [11] on the implementation of the Act XVIII of 2005 on district heating services. Since 2012, district heat suppliers have had the obligation to disclose these pieces of information to the public.

Act XVIII of 2005 on District Heating Services, Chapter 3, Article 18/A requires "that cogeneration shall be published broken down by premises, that district heat supply shall be published by settlements separately and that other activities shall be published in the supplement of the annual report as if they were carried out within the framework of an autonomous company." This implies that besides their regular balance sheet and profit and loss account, these companies have to prepare a balance sheet and a profit and loss account at the activity level (broken down by premises for district heat production and by settlements for district heat supply). Databases including the companies' annual reports were not relevant for my research because they do not include the data separated at the balance sheet group level or main group level. The tools of the analysis include the Excel program of the Microsoft Office 365 ProPlus package and SPSS 24 software.

Hypotheses and methods

In the study, two hypotheses are examined:

1. The largest part of the district heat suppliers' accounts receivable is the receivables rendered to clients. The rate of receivable rendered to clients is lower for companies whose household consumers are in a more favorable socio-economic situation.
2. Household consumers with a more favorable economic and social situation can be characterized by higher energy awareness.

The research questions, the variables (indicators) and the system of the performed calculations are included in Table 2.

Table 2:
Research questions, applied variables and statistical calculations

Hypothesis	Applied indicator	Calculation
1	Per capita personal income tax base (district level), Per capita number of job-seekers (district level), Per capita number of recipients of social support (district district), Local HDI (district level); Rate of receivables rendered to clients (based on the annual reports of district heating companies), Rate of receivables rendered to clients (based on reports separated from accounting point of view and typical for district heating)	Variance Analysis, Correlation Analysis
2	Local HDI (district level), Heat sold for heating purpose for one household consumer (corporate level), Number of household consumers accounted based on costs per one household consumer (corporate level), Average annual specific consumption of the upper annual heat consumption decile of household consumers (corporate level), Average annual specific consumption of the lower annual heat consumption decile of household consumers (corporate level)	Cluster Analysis, Logistic Regression

Source: Own edition

For later calculations, I consider it important to distinguish between district heat suppliers and companies providing district heating.

Act XVIII of 2005 on District Heating Services defines district heating as follows: "A commercial public service provided by the licensee, which supplies consumers with energy intended for heating or other heat utilization. The service is provided from a district heat producing facility through a district heating pipeline network". The Act and the related decrees do not prohibit companies providing these activities from engaging in other activities as well. Accordingly, besides district heating, the bulk of the 89 Hungarian district heat suppliers carry out other activities, including district heat production, electricity production, waste management, water utility supply and other activities related to urban management. The above-mentioned Article 18/A of the Act stipulates that the balance sheet and the profit and loss account have to be prepared at the activity level as well. This provided me with the opportunity to examine the rate of the total assets related to district heating and other activities and to examine what percentage of the net receipt of sales comes from performing district heat supplier activities. In the case of the examined population in 2017, the average rate of turnover from other (not district heating service) activities was 28%, while this rate was 33% for the assets. On this basis, I divided the district heat suppliers into two categories. Accordingly, reports of companies providing district heating subsequently refer to data from the whole set of annual reports while in the case of district heating reports, the base for calculations are the asset items necessary to provide district heating activity, after the separation from an accounting point of view.

Research results

To answer the first research question, the current asset structure of the companies needed to be analyzed.

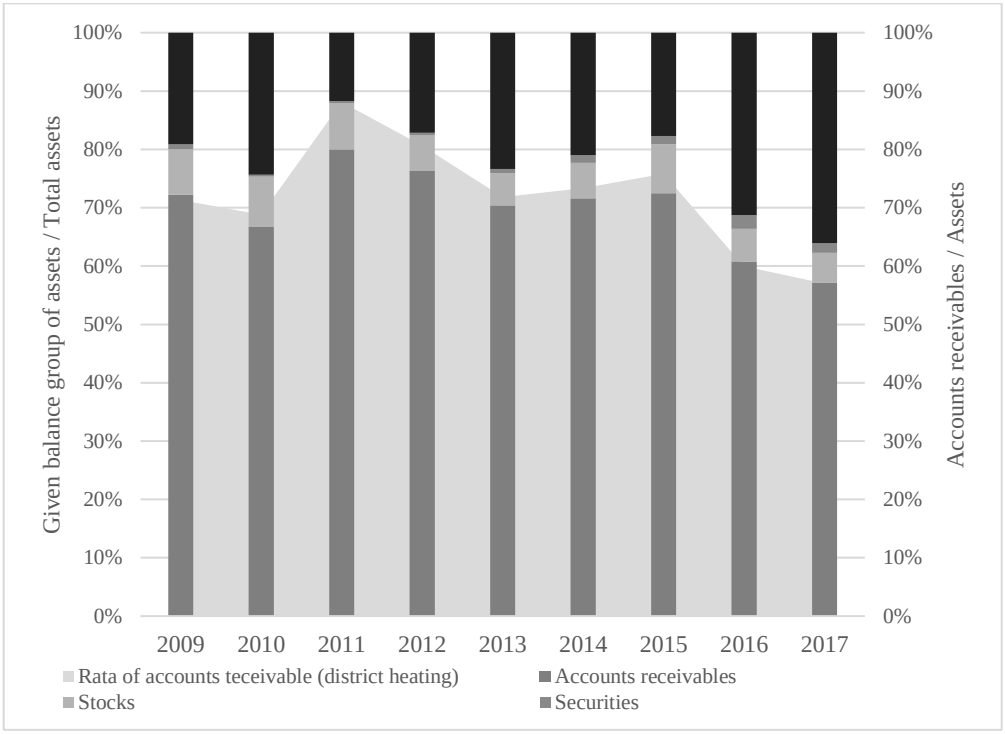

Figure 4: Distribution of current assets of companies providing district heating and the rate of accounts receivable based on the reports separated from accounting point of view (right-hand-side vertical axis) 2009-2017

Source: own compilation based on companies' reports

Figure 4 illustrates the specificities of district heat suppliers' management, which can be used to determine the following for the sector.(1) Due to their operational specificities, these companies have a negligible amount of securities (data from 2017 show that 85% of them belong to companies owned directly by municipalities and 15% belong to privately owned companies, while the rate was 0% for the two other groups in the whole period), and the rate of stocks was also low (below 10%) in the examined period for the whole sector. (2) Out of the short-term assets of the company, the rate of accounts receivable is determining and the amount of cash and cash equivalent is also remarkably high, the growth of which is demonstrable in absolute terms during the period under review. (3) Although the difference is not significant, it can be stated that if the data are treated separately, the examined companies were characterized by higher accounts receivable each year. It can be concluded that district heating is performed with a higher rate of accounts receivables than for companies which perform other activities as well.

In order to answer the second part of the first research question, the first step was to examine whether the location of the district heat supplier's site (including the residents living there(Síposné Nádori, 2016)) had any effect on the rate of receivables rendered to clients of district heat suppliers. To test it, Variance Analysis was conducted to examine to what extent

belonging to a given territorial unit (regional level) can be considered an appropriate grouping criterion. Table 3 summarizes the test results.

Table 3:
The strength of the relationship between the rate of receivables rendered to clients and region at the 5% significance level

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017
Eta	0.517	0.428	0.781	0.701	0.590	0.720	0.719	0.696	0.730
Eta (district heat)	0.868	0.635	0.869	0.778	0.651	0.754	0.772	0.755	0.765

Source: Own edition

The analysis revealed that at the 5% significance level, the region of the heat suppliers was an appropriate grouping criterion in each year, since different group averages of the rate of receivables rendered to clients can be observed both for the annual reports and for the reports separated from accounting point of view (the effect of grouping was stronger each year when the report separated from accounting point of view was examined, which implies that receivables rendered to clients of a district heating activity is determined by geographical region to a higher extent than the accounts receivables of the total corporate activity).

Subsequently, it was examined at a more detailed, district level, whether the socio-economic situation of the household consumers of the given district heat suppliers had an effect on the district heat suppliers'amount of debt. To do so, correlation analysis was carried out in the case of four selected and computed measures describing the social, income and economic positions and of a variable that examines the rate of receivables rendered to clients at three different levels. Results are summarized in Table 4.

Table 4:
Rate of significant relations between the independent and the dependent variables

Name	*	Clients / Assets	Clients / Current assets	Clients / Accounts receivable	(District heat) Clients / Assets	(District heat) Clients / Current assets	(District heat) Clients / Accounts receivable
Availability of the measure		9	9	9	5	5	5
JHDI 2011 and 2016	2	50%	50%	0	100%	0	0%
Per capita personal income tax base 2009-2017	9	56%	67%	33%	100%	80%	60%
Per capita number of job seekers 2009-2017	9	44%	33%	0	80%	20%	40%
Per capita number of recipients of social support 2009-2014	6	17%	50%	0	40%	20%	20%

Source: Own calculation

*Availability of the measure

There is a positive poor or medium strong relationship (Pearson Correlation) between per capita number of jobseekers, per capita number of recipients of social support, and the rate of receivables rendered to clients. There is a negative poor or medium strong relationship between the measures describing the socio-economic position (district level JHDI or per capita personal income tax base) and the measures of the rate of receivables rendered to clients. These results highlight that there is a relationship between the socio-economic status of household consumers and the rate of receivables rendered to clients. The district heat suppliers operating in areas

where the population has on average better social and economic conditions have on average lower debt amount.

The second research question is about the relationship between the energy efficiency of the household consumers and their socio-economic position. To quantify household energy efficiency, calculations started with data that companies have to disclose to the public yearly in connection with district heating. Accordingly, hierarchical cluster analysis was performed (Szilágyi et al. 2017) including the following variables: heat sold for heating purpose for one household consumer; number of household consumers accounted based on costs per one household consumer(corporate level); average annual specific consumption of the upper annual heat consumption decile of household users; and average annual specific consumption of the lower annual heat consumption decile of household users (corporate level).

With cluster analysis, two distinct clusters of energy use were created in different years. The results of the two clusters and the examined variables are shown in Table 5.

Table 5:

The two clusters created with hierarchical cluster analysis and the values of the variables

Report		**Variables**		
Ward Method		**V1**	**V2**	**V3**
Less energy efficient	Mean	100.72	277.61	0.26
	N	18	18	8
	Std. Deviation	52.69	62.80	0.13
Energy efficient	Mean	54.97	213.82	0.67
	N	20	20	20
	Std. Deviation	29.93	93.57	0.22
Total	Mean	76.64	244.04	0.48
	N	38	38	38
	Std. Deviation	47.66	85.73	0.27
1	Average annual specific consumption of the lower annual heat consumption decile of household users			
2	Average annual specific consumption of the upper annual heat consumption decile of household users			
3	Number of household users accounted based on costs per one household user			

Source: own edition

The available data made it possible to group 38 of the companies. The first group of companies is called‘less energy efficient’, where the annual specific consumption of the upper and lower annual heat consumption deciles of household consumers and also the rate of cost-sharing users (cost-sharing users are the users who can control the temperature of their apartment and thus control the price paid for the service) are lower. In the case of the energy efficient group of companies, the opposite of these trends was observed for the variables. From the research point of view, it was important to investigate whether there is an explanatory variable that can be used to characterize companies with consumers of average energy efficiency. Cross tables helped examine whether the ownership structure, sales size or the geographic position (district level) of district heat service were correlated with the two created clusters. The logistic regression was carried out with the aim of examining the effect of the

previously calculated LHDI describing the socio-economic background. For the Chi-square statistics used in the crosstab analyses, the critical significance level obtained for the spatial comparison was sig = 0.139, and for the other potential explanatory variables, significance levels were between 0.4 and 0.8. This highlights that there is no significant difference in terms of energy efficiency between companies with different ownership structures, with different sales sizes or with different geographical locations. The explanatory power of the function created with LHDI variable during the logistic regression calculation is extremely low (Nagelkerke R square = 0.09). LHDI can correctly identify companies with different energy efficiency only at 57%, which is hardly different from random classification (50-50%). Thus, the hypothesis that socioeconomic factors can influence energy efficiency has to be rejected. All analyses revealed independence; the listed variables cannot be used as grouping variables.

Summary

The study analyzed the asset structure of district heating companies along with two research questions by analyzing the annual reports of 72 companies for nine years. The statistical analyses highlighted that the socio-economic conditions of household consumers have an effect on the companies' accounts receivable and this effect can be shown for several indicators and for different levels of accounts receivable. Companies who operate in districts where residents have a more favorable economic and social background have on average a lower level of accounts receivables.

However, it is important to note that receivables rendered to clients is also determined by the clients and accounts receivables management practices included in the accounting policy of the companies, which include differences that determine how accounts receivable can be removed from the balance sheet, how they can be extinguished, and therefore their amount.

The second research question examined whether there is a relationship between the socio-economic characteristics of household consumers and the efficient energy use of the population or whether there are any criteria that could be used as explanatory variables. There was no proven link between the variables described above, which can be considered as a market for the company, as the potential for energy efficiency does not depend on the income position of the population and systems with higher energy efficiency also occur in less advantaged social areas.

Acknowledgement

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Tokár-Szadai, Ágnes

Changes in the Management Consulting Market in Northeastern Hungary, 2001-2016

The Institute of Business Sciences of the University of Miskolc carried out a survey of management consultant firms and enterprises in 2001, in 2005-2006, in 2011-2012 and in 2015-16 in Northeast Hungary. The goal of our surveys were to determine the situation (importance) of business consulting in the region, examine the changes in the selection criteria of a management consultant, and gain information on the entrepreneurs' experiences with consulting services in the last 15 years.
Key words: Survey, satisfaction, management consulting service, client, selection criteria, clients' requirements, Northeast Hungary
JEL code: L84, M53, O15

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Introduction

The terminology for the profession of consultancy is not unified either in the Hungarian or in the international literature. There are many variations. The International Council of Management Consulting Institutes (ICMCI) states, "[t]oday, the field of Management Consulting is dynamic, fast-paced and both global and local at the same time. ... Management Consulting has a broad scope of practice with many sub-specialties. This said; any management consultant professional needs to have a functional competence in core aspects, along with a personal commitment to continually advance their knowledge, skills and practice in both the core and specialty areas of practice. Another important component to being a professional is the care and judgment to not exceed one's personal competence; and to call-in or recommend colleagues with the particular wisdom required by their client, when their client is challenged to explore beyond the management consultant's expertise." (ICMCI 2020) The Management Consultancy Association (MCA) has defined management consulting as "the practice of creating value for organisations, through improved performance, achieved by providing objective advice and implementing business solutions" (MCA 2020).

There are two main approaches in the relevant literature of consulting: the first approach takes a broad view of consulting. Peter Block, for instance, suggests that "[y]ou are consulting any time you are trying to change or improve a situation but have no direct control over the implementation… Most people in staff roles in organizations are really consultants even if they don't officially call themselves consultants" (Block 2000, p. 2).

The second approach views consulting as a special professional service and emphasises the characteristics that the consultant must possess. The essential points and the fundamental principle of management consulting are included in the definition of Larry Greiner and Robert Metzger, which has been quoted in a number of books and articles: "Management consulting is an advisory service contracted for and provided to organizations by specially trained and qualified persons who assist, in an objective and independent manner, the client organization to identify management problems, analyse such problems, recommend solutions to these problems, and help, when requested, in the implementation of solutions" (Greiner and Metzger 1983, p. 7).

The first approach emphasises that consultants are helpers: they help managers or anyone else solve problems. In this approach a manager can also act as a consultant if he or she gives advice and help to employees rather than direct orders to them. The second approach views consulting as a special profession. The two approaches can be regarded as complementary rather than conflicting. Management consulting can be viewed as a professional service and as a method of assisting organisations to improve management and business practice. This approach

is used by professional associations and institutes of management consultants. According to the European Federation of Management Consultancies Associations (Federation Européenne des Associations de Conseils en Organisation, or FEACO), "Management Consultancy covers a wide array of services and can be defined as the rendering of independent advice and assistance about management issues. This typically includes identifying and investigating problems and opportunities, recommending appropriate action and assistance with the implementation of the recommendations" (FEACO 2020).

According to Milan Kubr (2002) the aim of consultancy is to fulfil organisational objectives and tasks. This includes not only the resolution of problems but also the identification of new opportunities, accumulation of knowledge and making the necessary changes. In the current article a Kubr's (2002, p.10) terminology is used, with the following definition for consultancy: "Management consulting is an independent, professional advisory service assisting managers and organizations to achieve organizational purposes and objectives by solving management and business problems, identifying and seizing new opportunities, enhancing learning and implementing changes." Kubr highlights the role of consultants in providing knowledge and information, in making decisions, and reducing uncertainty during implementation.

However, according to the literature, there are consultants who increase uncertainty (Sturdy 1997). Pemer and Werr (2013) focus on hiring business consultants and cooperating with them; they highlight client uncertainty in relation to the consulting service and how these uncertainties are connected to hiring consultants and consultant-client relations.

According to previous research (Glückler and Armbrüster 2003; Mitchell et al. 2003) there are three types of uncertainties related to selecting and hiring consultants (Pemer and Werr 2013). These are performance, relational and psychosocial uncertainty.

Performance uncertainty: this low-level institutionalization of the consultancy industry leads to a low entry level, which is seen as a significant asymmetry of information between consultants and clients. For the client, it is doubtful what he can expect from a consultant, how he can distinguish qualified consultants from unqualified ones, and how he can assess the level of professionalism of the consulting company (Glückler & Armbrüster 2003).

Relational uncertainty: many scholars (Maister 2003; Sturdy 1997) indicate that clients tend to doubt whether consultants place take their clients' interest in the forefront or they act primarily according to their own interests. Although knowledge transfer is an important consultant function both outside and within the industry (Besant and Rush 1995), clients are afraid that their competitors might take sensitive information (Glückler and Armbrüster 2003; Kipping and Armbrüster 2002).

Psychosocial uncertainty: this derives from the client's own (psychological part) and his coworkers' (social part) reaction to hiring a business consultant. Managers make an agreement with an outsider to the company to achieve results and this may result in distress and skepticism within the organization (Bergholz 1999). Coworkers may deny cooperation, hide information, and be cynical, which may jeopardize the project (Mitchell 1994).

"Choosing the right partner for the project is one of the most important parts, as the result of consulting cannot be evaluated totally beforehand." (Toivola, 2012, p.12) According to Toivola, the proposal of the solution and the person who is going to conduct the solution matter the most.

These uncertainties affect clients' behavior; managers can count only on their previous positive experience and on the consultant company's reputation (Glückler and Armbrüster 2003). These conditions guarantee competence, loyalty, and supportiveness; managers consider these key factors in choosing and successfully commissioning consultants (Pemer and Werr 2013; Kubr 2002; Schein 1999).

The aim and interest of the client seeking advice is to hire a consultant who is the best at solving his particular problem and can cooperate with the company's coworkers and managers most efficiently. Clients are rarely asked how they see themselves as customers, how they see the client-consultant relationship, and what kind of uncertainties they encounter when hiring a consultant (Pemer and Werr 2013). In this article the changes in the selection criteria of a

management consultant and the entrepreneurs' experiences with consulting services will be examined between 2001 and 2016.

Research methodology

The Institute of Business Sciences of the University of Miskolc conducted a survey in 2001, 2005-06, 2011-12 and 2015-16 among consultants and their clients. The questionnaire, which served as the basis for the empirical research, was compiled keeping in view the lessons that could be drawn from previous surveys known from the international literature (Woog and Rüeger 1997; Hözelbarth 2000), and from another newer Hungarian survey (Szilágyiné 2015, Szűcsné 2019). An important aspect of structuring the questionnaire was approaching different questions from several points of view, increasing the reliability of the results and consequences to be drawn based on the answers. The original questionnaire is found in my PhD dissertation (Tokár-Szadai 2010, pp. 187-232). This study is based on some important questions from the complex study. A summary of our empirical surveys and questionnaires and the composition of the samples may be found in Tokár-Szadai (2017). Our empirical studies are summarized in Figure 1.

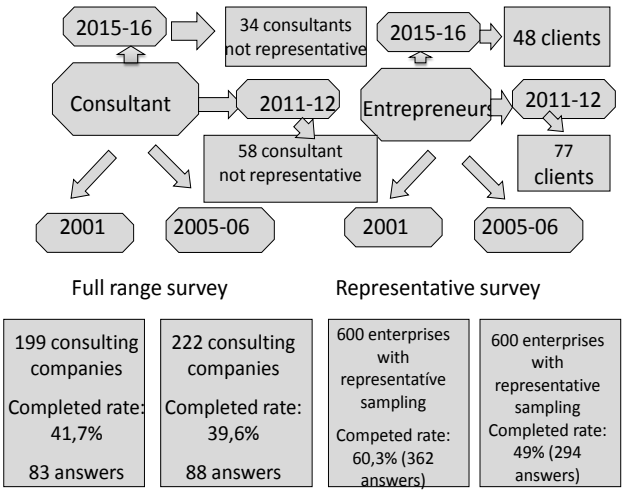

Figure 1. Structure of empirical studies
Source: Author's illustration

The research was extended to consult Borsod-Abaúj-Zemplén county companies regarding the use of consulting services. The enterprises to survey in 2001 and 2005-06 were chosen by their fields of activities, considering the distribution of geographical locations with a random sampling method. In both years we made a full-scale survey of management consultants which were registered under the TEÁOR number 7414 "management consulting" in Borsod-Abaúj-Zemplén County.

The empirical research carried out in 2011 and 2015-06 are based on non-representative sampling. One or two clients of the surveyed consultants completed the questionnaire on the "consulting experience of the consultants' clients". (We used the "snowball method" for sampling: consultants suggested their clients, and entrepreneurs their consultants.) The comparability with our former surveys is restricted, because the samples are different: the surveys in 2001 and 2005 focused only on Borsod-Abaúj-Zemlén County, while the samples in 2011-2012 and in 2015-16 were from different counties (mainly from Northeast Hungary). The previous empirical research consisted of two major parts: it focused on consultants and

enterprises, while the present surveys focus on the consultants and on their clients. The two surveys cannot be directly compared, but they can help us conclude what the trends are.

The response rate was higher among larger companies than smaller ones, so larger companies are over-represented (Figure 2).

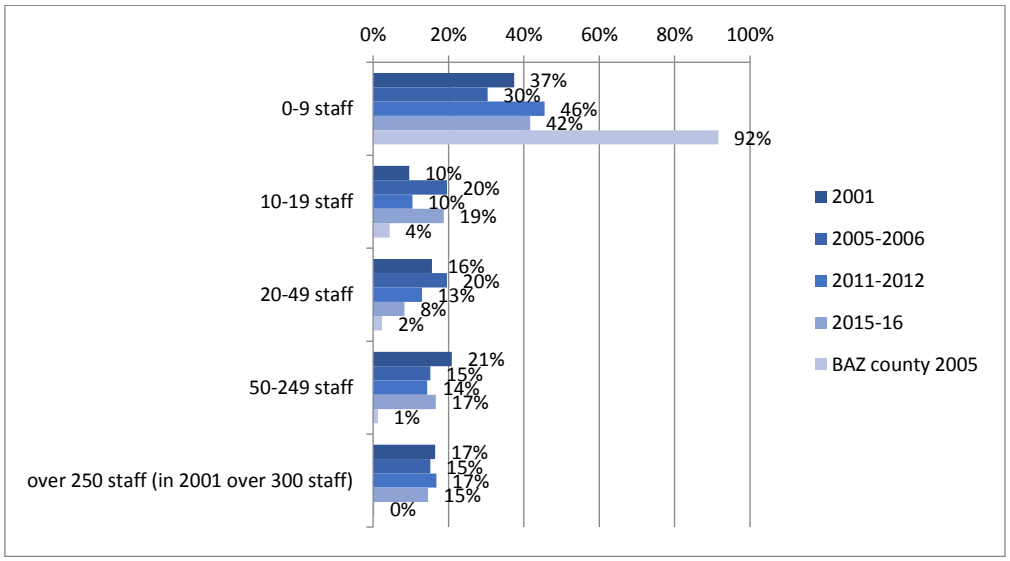

Figure 2. Distribution of the companies in Borsod-Abaúj-Zemplén County (2005) and examined companies (consultants' clients) by number of staff in 2001, 2005-06, 2011-12 and 2015-16

Source: Author's illustration

More than one third of the examined companies (30-46 %) are micro-enterprises (0-9 staff), 26-40% small enterprises (10-49 staff), 14-21% medium size enterprises (50-249) and 15-17% big companies. Overrepresentation is justified, because larger companies can better afford to hire consulting companies than smaller ones.

In this paper the software package SPSS 14.0 is used for analysing the database. The hypotheses are tested by variance-analysis by the significance level 5%.

Changes in the selection criteria of a management consultant

When selecting a consulting company, it is important to carefully consid and take into account many aspects in order to choose the most appropriate consultant. We asked consulting firms and their clients to analyse what the criteria are by which the clients choose consultants. Respondents evaluated different aspects on a Likert scale of 1 to 5, where 5 means the choice is based only on this criterion, while1means that it does not play any role in the choice.

In the consultant selection, the importance of various aspects (2015-16) and their change (between 2001 and 2016 at a 5% significance level) are summarized in Table 1, according to the value of entrepreneurs (E) and consultants (C).

Table 1:
In the consultant selection, the importance of different aspects (2015-16) and its change (between 2001 and 2016) according to the values for Entrepreneurs (E) and Consultants (C)

Increase 0≤Sig≤0.05	Nationality (C:2.12)	Size (C:2.7)	Personal relationship (E:4.43) Reputation (E:3.87, C:4.21) Friends' opinion (E:3.64, C: 4.18) Service complexity (C:4.42)
Stagnate* Sig>0.05	Size (E:2.43) Advertisement (E:2, C: 2.28)	Regional seat (E:2.98, C: 2.79) Regional office (E:2.85, C: 2.62) Payment condition (C: 3.18)	Service complexity (E:4.4) Consultants' relationships (E:4.1, C:4.03) Deadline (E:4.04, C:3.61) Price level (E:3.83, C: 3.64) Former working relationships (E:3.83, C:4.35) Consultants' references (E:3.69,C:3.88) Personal relationship (C:4.59)
Decrease 0≤Sig≤0.05	Nationality (E:1.66)	Payment condition (E:3.55)	
	Less important 1.5-2.49	**Medium important 2.5-3.59**	**Important 3.6-4.6**

*At the 5% significance level, the date of survey does not affect the selection criteria: they have not changed in the 15 years examined.
Source: Tokár-Szadai (2018)

There is not much difference between the values of consultants and their clients' values: consultants have recognized the importance or neglect of each factor. As the table shows, Hungarian managers can build on their positive experience of previous personal trust and the reputation of the consulting network when selecting a consultant. This result is in line with international surveys (Glückler and Armbrüster 2003). According to clients examined in the one and a half decades (2001-2016), the significance of three important aspects of the consultant's selection has increased: the personal relationship with the consultant, the reputation of the consulting firm and friends' opinions. Other important factors in the consultant's selection are the complexity of the offered service, the consultants' relationships, the deadline for the submission, the price level, the former working relationships and the assigned references.

The role of regional seat and branch offices in the election is of medium importance, and its role has not changed in the reviewed period. Quick access to a consultant and –if necessary – fast, personal support give clients a sense of security, although they are right to see that these are not the most important selection criteria.

The applied payment conditions also play a medium role in the election, according to clients. Its significance increased especially in difficult times, comparing 2005-06 and 2011-12, presumably due to effects of the 2008 global economic crisis; following the end of the crisis, in 2015-16 its role decreased.

Entrepreneurs' experiences with consulting services

According to Kubr, different methods can be usedin the evaluation of the consulting process, and the "process can be more or less collaborative and participative, and more or less effective." (Kubr 2002, p. 251) The principal dimensions of the consulting process are:

- The design of the assignment (the contract);
- The quantity and quality of inputs;
- The consulting mode (style) used;
- The management of the assignment by the consultant and the client.

According to our surveys almost all surveyed entrepreneurs (95.9% in 2015-16) were satisfied with their consultant, and based on their experience they would entrust him or her again. Of these, 56.3% were so satisfied that they would recommend others to hire the consultant. An insignificant part of the entrepreneurs (3.4% in 2001, 2.1% in 2005-06, nobody in 2011-12 or in 2015-16) were disappointed with the consultant, and only 2% in 2001 (nobody in 2005, 2011-12 and in 2015-16) responded that the consultant hired ruined the reputation of the whole consulting profession.

Clients' satisfaction with management consulting services is increasing in each new study. To enhance the efficiency of cooperation between the consultants and their customers, it is essential to get to know each others` value systems and expectations and to construct a common understanding and common language for the actors and the society; hopefully this preferential tendency will be stable and long.

The entrepreneurs evaluated on a 1-5 scale how solution-oriented the proposals of the consultant were, the relation between the price of the service and performance, how they view their relationship with their consultant, and the professional competences of consultants. 1 means: they are totally dissatisfied, 5 means: they are fully satisfied and would hire him or her again. Figure 3 shows the average mark of the examined clients' evaluation in the case of successful and unsuccessful projects:

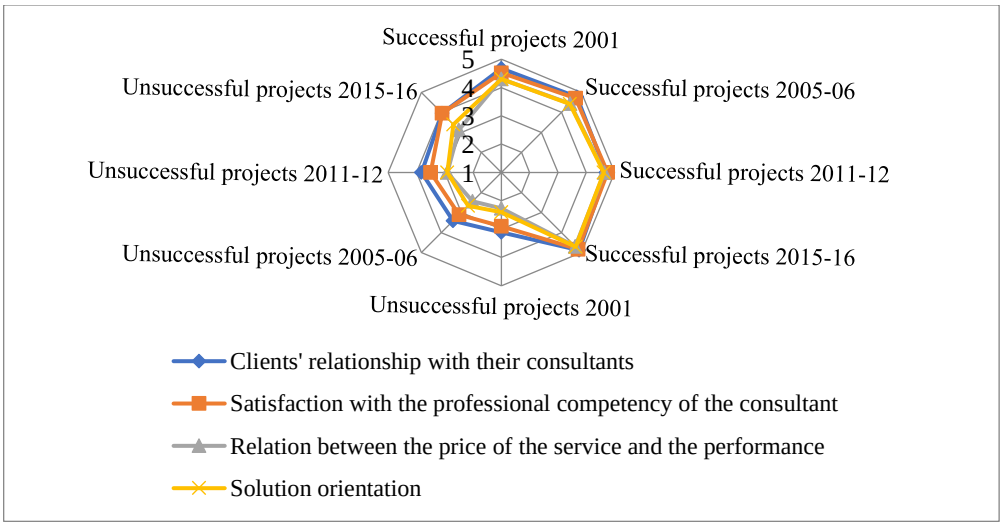

Figure 3. Satisfaction with consulting service and consultants in the case of successful and unsuccessful projects from the four surveys
Source: Author's illustration

The satisfaction with successful and unsuccessful projects, with professional competency of their consultants, with solution orientation of proposals, and with the relation between the price of the service and performance, and with the personal relationship with small and medium-sized

consulting companies have improved a little, but it has not changed significantly in the last 15 years.

Examined entrepreneurs are fully satisfied with successful projects, and while they are less satisfied with unsuccessful projects, they have not judged it totally useless or a waste of money to involve a consultant. In the case of unsuccessful projects they have not lost their confidence in their consultant totally (they evaluated him or her on a medium level). The cause of this might be that the majority of the examined companies have had a good working relationship with their consultants for years, they have carried out a lot of successful projects together, and they have not changed their mind because of an unsuccessful project. The cause of the failure is not the personal relationship or professional competency of consultant, but solution orientation and relation between price of the service and performance.

Figure 4 shows the average mark of the examined clients' evaluation in the case of assignment different types of consultants:

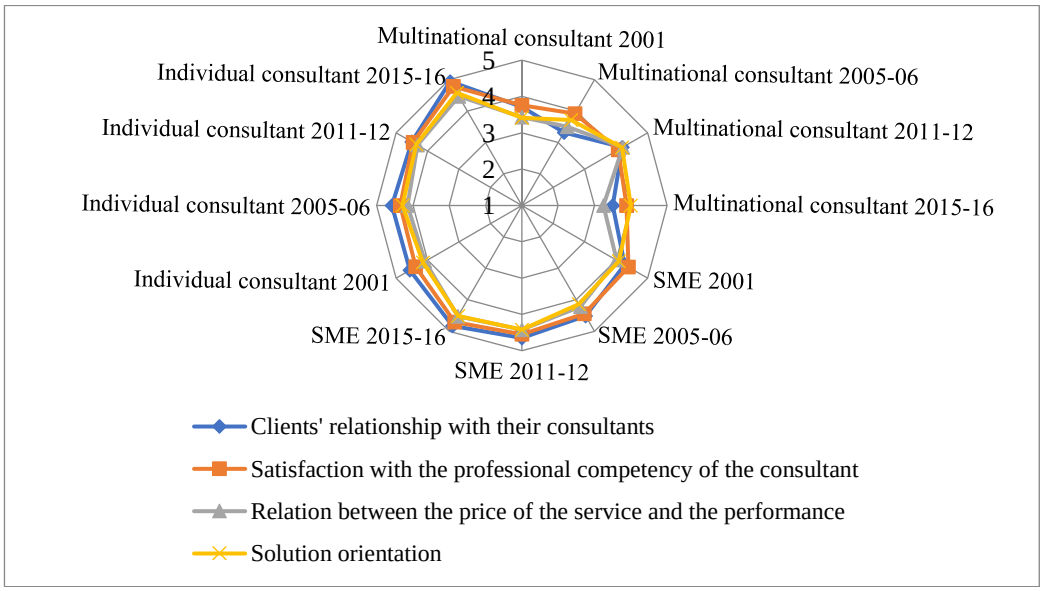

Figure 4. Satisfaction with consulting service and consultants for different types of consultants

Source: Author's illustration

According to our surveys, the companies in our region were more satisfied with the work of the small and medium-sized consulting companies in the region and the individual consultants. It is worth noting that bad experiences are not at the background of this; significantly fewer enterprises have had business relations with multinational consulting firms: 98% of the enterprises in the 2015-16 survey had hired smaller consulting firms (SMEs or individual consultants) in 2015-16 and only 14.6% have experience also with multinational consulting firms. The majority of the complaints in 2015-16 are about solution orientation: 20.8% of the entrepreneurs that requested the service felt theyreceived general, schematic advice for their unique problems, while 16.7% could not apply the advice they got.

Conclusion

Each consulting process is an interaction between consultant and client and involves the exchange of the client's money and consultant's time from an efficiency aspect. Consultants expect a fee from the client as well as the information that is necessary for their work (data and

cooperation), and as added value they do the required survey analyses and evaluations, recommend solutions to achieve goals, identify and seize new opportunities and help, when requested, in the implementation of solutions (Tokár-Szadai 2013).

According to our surveys, in 2001, 2005-06, 2011-12 and 2015-16 entrepreneurs were more satisfied with the personal relationship and professional competency of their consultant than with the solution orientation of proposals and the relation between the price of the service and performance, but fundamentally they were also satisfied with these.

In all periods they were more satisfied with the service of smaller business consulting companies than with multinational consultants: their working relationship with individual consultant is more personal, in their experience smaller consultant's performance is on a high level, and they can better accommodate themselves to the special local conditions, so their flexibility and knowledge of the local problems make them more convenient to the clients.

In order to be a successful consultant, beside factual knowledge (which includes methodological knowledge, professional practice, innovative thinking, and the ability to search for customized, modern solutions) one needs the ability to convince, which also requires adaptability, professional authenticity, and empathy in order to make the client understand and apply the proposed solution, that is to adopt the consultant's advice. Nowadays, it is not enough for a client to be satisfied with his consultant's work or loyal to the service. Maister et al. (2000) believe that truly successful consulting firms are trying to reach a "trusted advisor" status (Poór, 2010).

According to our surveys, consultants - in the majority of their selection criteria – rate the importance of each criterion similarly to their clients and similarly perceive their change. Consultants would better meet the needs of their client with more flexible, more complex, solution-oriented, and more tailored advice.

The empirical research – which was exclusively aimed at the analysis of enterprises and consultants located in Northeast Hungary – is not suitable for drawing more general conclusions on national or international levels.

Probable it would be advisable for consultants to take advantage of modern tools even better and more targeted than traditional methods, to make them more aware of the tenders, and to make use of the possibilities of internet advertising and search. Our survey did not cover this interesting topic; it maybe a hypothesis for future research.

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Szendi, Dóra

Change in the Innovation Potential of the Northern Hungary Region

Innovation is an important indicator of regional economic development and competitiveness (for example, improved innovation performance may increase the competitiveness of countries).This recent study analyzes the innovation potential of the North Hungary region in national and international comparison. It can be stated that while the region concentrates 11.2% of the Hungarian population and 7.97% of the GDP, its weight in R&D is far below (3.2%) its economic situation or its population share. In most of the indicators examined, the region is one of the most disadvantaged within the country.
Keywords: innovation potential, Northern Hungary region, development.
JEL code: O3, R12

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Introduction

In the European Union, studies on territorial disparities have been a topic for decades. There is an increasing need for detecting the differences and for analysing convergence. According to the consensus of several authors, innovation is the main driver of development and convergence (Ewers and Brenck, 1992; Kocziszky et al. 2015). The literature is paying increasing attention to the regions' innovation potential, mainly due to its active contribution to economic growth and competitiveness (Szendi, 2018). In the classical concept of Schumpeter (1934, p. 66) innovation can appear in five different forms: "the introduction of a new product/or a new quality product; application of a new production technology […]; opening up a new market […]; new sources of supply for raw materials and semi-finished products […]; or introducing a new form of organization in an industry". Based on the researchers opinion, innovation is a critical factor in regional development. In Schumpeter's words, innovation is the engine of growth for individual companies, regions and nations (Lim, 2006). Similarly, in Romer's endogenous growth model, economic development depends on investment in human capital, knowledge and innovation (Romer, 1994).

Innovation is aimed at increasing productivity, contributing value added and gaining a competitive advantage, which ultimately leads to increased economic development in countries and regions (Paas and Vahi, 2012). Thus, innovation can contribute to the increase in the competitiveness of a region, as is illustrated by Lengyel's (2000) model of competitiveness. That is why it is moving increasingly into the focus of regional economic policies, and also in the EU's regional policy (Szendi and Papp, 2017). The Lisbon Strategy, and then the Europe 2020 Strategy, identified competitiveness as a high priority, which can be partly achieved by improving the capacity for innovation (Balázs and Jakab, 2017). Many authors (Kocziszky, 2004; Grosz and Rechnitzer, 2005; Rechnitzer, 2007; Bajmócy, 2008) have demonstrated the relationship between regional economic development and research and development. The purpose of this study is to investigate the R&D potential of the Northern Hungary region and to analyze its changes. The reason for selecting the region is that this is one of the least developed regions of Hungary, its innovation potential is lower than in the western part of the country, and therefore there is a risk of a development trap (a situation, when a region is at first time rapidly increasing until a given level, but it is not able to move on from this and to become a highly developed territory, Csath, 2019). In my hypothesis, the last few years have resulted in positive changes regarding the innovation potential of the region, but the catch-up is a long-lasting process that is influenced by several factors. In the first part of the study, I will summarize the main connections of innovation and competitiveness of the regions, and then I will present the

changes in the region's innovation potential from 1996 until now, including the positioning of the region and its counties.

Theoretical background

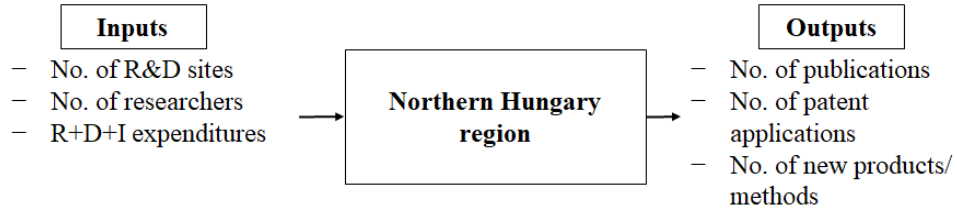
According to the consensus of Hungarian and international literature (e.g. Kocziszky, 2004; Paas and Vahi, 2012; Lee and Rodríguez-Pose, 2013; Ciocanel and Pavelescu, 2015), there is a significant relationship between the innovation potential of a region (R&D capacity of a given region) and its competitiveness and long-term development. The innovation potential of the sub-national levels has particular importance, since there are no two points in space which have the same characteristics, because their economic, social and cultural parameters are different (Benedek and Kurkó, 2011). Thus, the innovation potential of a country may have a characteristic spatial structure and show significant territorial disparities (Bajmócy and Szakálné, 2009).

The examination of the regional innovation potential is an important priority for the EU, since the cohesion and convergence objectives of the regional policy can be effectively achieved by improved R&D and innovation activities (Grosz and Rechnitzer, 2005). The less-developed regions with lower GDP have lower R&D expenditures and lower innovation potential than the more developed regions (Grosz and Rechnitzer, 2005), and the performance of the more innovative regions is higher (Weibert, 1999).

When analyzing the relationship between innovation and economic growth, Lee and Rodriguez-Pose found that innovation is one of the drivers of regional economic success. Innovative regions grow faster and can achieve higher average incomes (Lee and Rodríguez-Pose, 2013). The reason for this can be found in high technology, a high number of patent applications and R&D expenditure. Others, on the other hand, emphasize that as innovative regions tend to achieve higher productivity and income levels, they further enhance the regional economic disparities (Paas and Vahi, 2012). Thus, it is indisputable that regional development and convergence depend on innovation, but it is also influenced by many other factors (Paas and Vahi, 2012).

In Hungary, the R&D activities (expenditure, research sites, patents and publications) are characterized by a strong concentration in Budapest. Besides that, only counties with university centers have significant R&D potential (Keczer, 2009). The mid-term vision of the Northern Hungary region for the period 2014-2020 states that the region aims to achieve a higher level of environmental efficiency through the higher, more efficient and sustainable utilization of natural resources, and the competitiveness of traditional and intelligent specialization industries, to become an international recognized innovation center (NORRIA, 2013).

In this study, I have structured the analysis of the region's innovation potential as seen in *Figure 1*. In the first step I review the input side factors (number of R&D sites and their researchers, R&D expenditures), which basically represent the innovation potential of a region, then I examine the outputs (publications, patents) resulting from the innovation process, which highlight the performance of the regions.



Data sources: HCSO database, Eurostat database, European Innovation Scoreboard, Regional Innovation Scoreboard

Figure 1: Research logic
Source: own compilation
Note: HCSO – Hungarian Central Statistical Office (KSH)

The innovation potential in the region according to the European Innovation Scoreboard

When analyzing the innovation potential of the Northern Hungary region, first I have positioned the region among the EU regions. The European Innovation Scoreboard compares the innovation performance of the EU member states on the basis of a complex innovation index; the current version (2019) contains 10 groups of factors and 27 indicators. Indicators are defined in four key areas: framework conditions, investments, innovation activities, impacts. These factors help us to analyze the strengths and weaknesses of each country and identify the key areas to focus on when assessing innovation potential (European Commission, 2019).

The European Innovation Scoreboard has been published since 2010, so we can identify the trends and monitor the changes. Based on the complex innovation index, the member states can be classified into four different groups (European Commission, 2019):

- Leading innovators (Sweden, Finland, Denmark and the Netherlands) whose performance is more than 20% above the EU average;
- Strong innovators (Luxembourg, Belgium, UK, Germany, Austria, Ireland, France, Estonia), where the innovation performance is around 90-120% of the EU average;
- Moderate innovators, whose performance is slightly below (about 50-90%) the EU average (Portugal, Czechia, Slovenia, Cyprus, Malta, Italy, Spain, Greece, Latvia, Slovakia, Hungary, Lithuania, Poland and Croatia);
- lagging innovators, where the innovation performance is below the 50% of the EU average (Bulgaria and Romania) (Balázs and Jakab, 2017; European Commission, 2019).

Hungary belongs to the group of the moderate innovators, but its innovation performance has slightly improved since 2011 (from 66% to 69% by 2019 compared to the EU average). Hungary is the 23rd among the 28 member states in 2019 and third among the Visegrad countries after Czechia and Slovakia *(Table 1)*.

Table1:
Hungary's position in 2019 compared to the "Visegrád Four" on the basis of the European Innovation Scoreboard (EU2011=100%)

	Summary innovation index	1. Human resources	2. Attractive research systems	3. Innovation-friendly environment	4. Finance and support	5. Firm investments	6. Innovators	7. Linkages	8. Intellectual assets	9. Employment impacts	10. Sales impacts
EU	108.8	122.3	112.6	158.1	109.4	119.2	90.8	103.9	97.3	104.4	103.0
CZE	89.4	91.7	73.6	118.6	51.1	112.6	88.0	87.3	62.1	123.6	95.8
HUN	69.0	53.7	55.9	144.7	46.2	98.0	30.9	57.1	40.1	124.2	84.1
POL	61.1	70.4	34.6	197.9	39.1	87.3	15.0	32.4	67.4	96.5	56.1
SVK	69.1	86.1	46.7	90.9	26.1	79.7	37.9	60.1	38.7	113.3	114.5

Source: Own compilation based on European Commission (2019)

The innovation scoreboard does not distinguish between input and output factors, but establishes a cumulative score based on each factor. However, an overview of the components indicates that Pillars 1, 3, 4 and 5 make up the input side, while the remaining six pillars form the output side.

Input-side factors

In the case of Hungary, in terms of input factors the human resources pillar, which counts the number of new doctoral degrees granted and the number of people involved in lifelong learning, is one of the worst among the Visegrad countries in 2019. The biggest problem can be identified in the case of this pillar, where only Romania and Italy are behind us. The country ranks second among the V4 countries in the pillar of innovation, corporate investments (business R&D expenditure) and finance (public R&D expenditure and venture capital investment).

Output-side factors

The output side of indicators shows that Hungary is ranked third in the Visegrád Four in terms of its cumulative score. In international-domestic co-publications, both the Czech Republic and Slovakia have significantly higher values; however, in the number of scientific publications among the top 10 most cited, the Hungarian value is the highest in the V4. The Hungarian rating in the pillars of innovators (innovative products and services of small and medium-sized enterprises) and intellectual property (number of patents, trademarks) is extremely low, which also worsens the overall evaluation of Hungary.

The Regional Innovation Scoreboard (RIS), a regional extension of the European Innovation Scoreboard, measures the innovation performance of European regions based on 18 indicators. The RIS 2019 examines 238 regions and presents the position of the regions according to the components shown above.

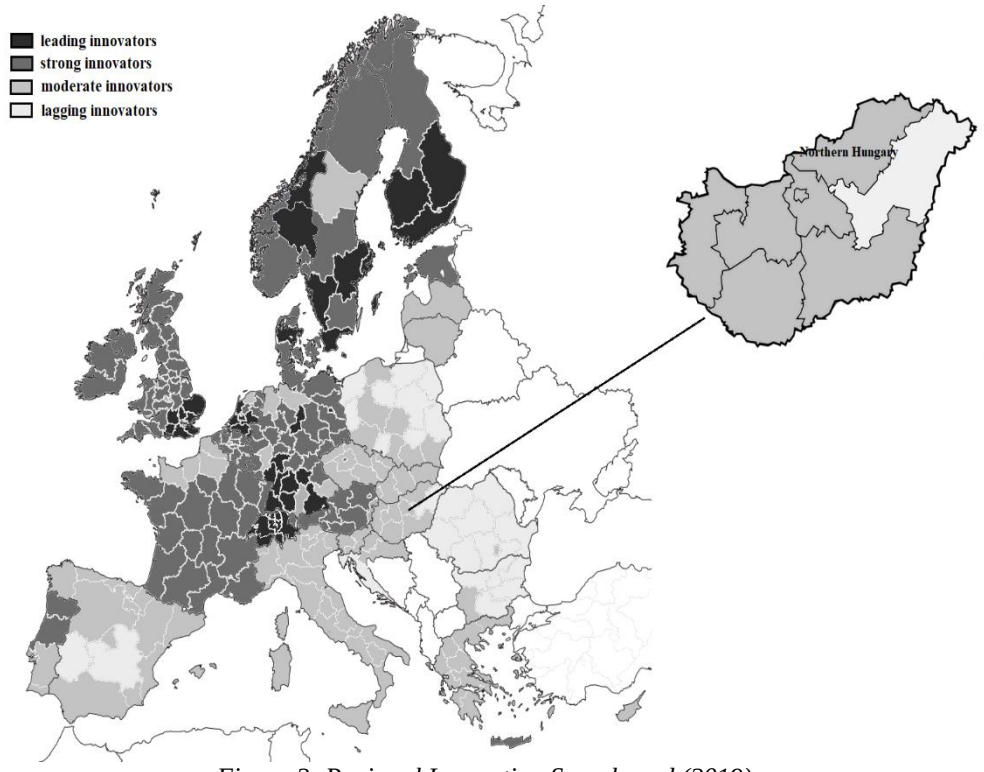


Figure 2: Regional Innovation Scoreboard (2019)
Source: European Commission (2019)

The Northern Hungary region belongs to the group of moderate innovators *(Figure 2)*, with significant difference to the EU average (53.1%). The largest gap compared to the EU average can be found in the following components *(Table 2)*:

- input side: share of population with tertiary education (48%), lifelong learning (35%), public R&D expenditure (20%),
- output side: scientific publications (29%), public-private joint publications (19%), patents and trademarks (26%).

Table 2:
Innovation score of the Hungarian regions according to the Regional Innovation Scoreboard (EU2011=100%)

	RIS2011	RIS2013	RIS2015	RIS2017	RIS2019
Budapest	85.6	85.0	83.6	84.1	84.4
Pest	75.2	75.9	73.0	77.4	81.5
Central Transdanubia	59.7	57.3	55.8	58.1	53.4
Western Transdanubia	60.1	50.3	56.2	51.5	55.1
Southern Transdanubia	50.5	48.9	52.3	49.2	53.3
Northern Hungary	47.6	46.9	51.2	47.8	53.1
Northern Great Plain	50.8	49.4	51.5	53.2	52.0
Southern Great Plain	53.4	55.8	59.4	58.4	54.5

Source: Own compilation based on European Commission (2019)

It can be seen that both the input and the output side have a significant lag in some components. In Hungary, the Central Hungarian region is the only one with good performance among the moderate innovators, while the Northern Great Plain region belongs to the lagging innovators. The performance of the Northern Hungary region has improved since 2011, mostly in two input-side factors (innovation expenditures in non-R&D sector; employment in high-tech manufacturing and knowledge-intensive services). This may be a favorable trend towards the outputs in the future.

4. Analysis of the region's innovation potential

Through the analysis of the innovation potential and R&D position of the Northern Hungary region in the period of 1996-2018, I have examined the number of R&D sites in the region, the number of their employees, the R&D expenditures used and the number of patents they create. The sources of the data are the database of the Central Statistical Office and the Eurostat database. The three counties of the Northern Hungary region (Borsod-Abaúj-Zemplén, Heves and Nógrád) contain 11.2% of the country's population and 7.97% of its total GDP, but only 3.2% of its R&D expenditure.

Input side factors

A detailed review of R&D data shows that the region's position among the Hungarian regions is not very favorable. The number of research and development sites in the Northern Hungary region is the lowest. In 2018, there were 191 research sites, which is 6.2% of the national total *(Table 3)*. Most of the R&D sites in Hungary are located in the capital region, which concentrates more than half of all Hungarian research locations.

Table 3:
Number of research and development sites in the Hungarian regions and in counties of the Northern Hungary region

	Number of research and development sites				Number of research and development sites (% of total)			
	1996	**2000**	**2010**	**2018**	**1996**	**2000**	**2010**	**2018**
Central Hungary	710	998	1471	1820	48.6	49.4	49.3	52.1
Central Transdanubia	64	161	203	228	4.4	8.0	6.8	6.5
Western Transdanubia	109	146	256	260	7.5	7.2	8.6	7.4
Southern Transdanubia	125	130	203	233	8.6	6.4	6.8	6.7
Northern Hungary	101	110	191	218	6.9	5.4	6.4	6.2
Northern Great Plain	162	248	307	313	11.1	12.3	10.3	9.0
Southern Great Plain	190	227	352	419	13.0	11.2	11.8	12.0
Borsod-Abaúj-Zemplén	63	81	109	114	4.3	4.0	3.7	3.3
Heves	36	35	71	83	2.5	1.7	2.4	2.4
Nógrád	2	2	11	21	0.1	0.1	0.4	0.6

Source: own compilation based on HCSO data

Analyzing the change in the number of research sites, we can see that in1996 the Central Transdanubian region had the lowest value, which underwent significant improvement until 2000, while the Northern Hungarian region was almost always in the last position *(Figure 3)*. The fact that Nógrád County has one of the lowest numbers of R&D sites (tied with Tolna County) plays a significant role in the region's unfavorable situation. For research and development sites per 10,000 inhabitants there was a slight decline in all regions after 2013, followed by an improving trend from 2016 in almost all regions.

In terms of the EU, there have been significant positive shifts in the number of researchers in the CEE region, counting also the regions of the former country of East Germany (Berlin and its surroundings, Sachsen and Sachsen-Anhalt) and the Visegrad countries. In the Visegrád country group, the number of regions with more than 5,000 researchers has increased in all countries (in Hungary: the Central Hungary, Northern Great Plain and Southern Great Plain regions belong to this group). In the EU, the differences between the western and the eastern countries are sharp regarding the number of researchers among the most developed and the least developed regions (maximum: Oberbayern (Germany) 87,300 and minimum: Ciudad Autónoma de Ceuta (Spain) 35).

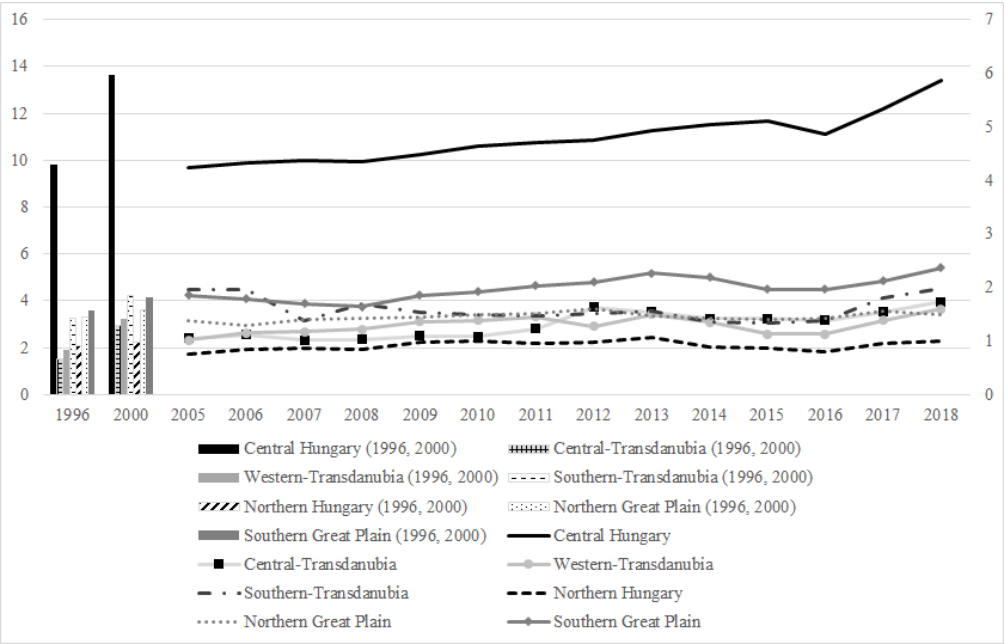


Figure 3: Number of research and development sites per 10,000 inhabitants (1996, 2000, 2005-2018)

Source: own compilation based on HCSO data

The number of researchers per 1,000 inhabitants has been the lowest in the Northern Hungary region in every year since 2000, with an average of two R&D personnel per 1,000 people, while in the case of Northern Great Plain and Western Transdanubia this is around 3.5 people. In Northern Hungary, 60% of the nearly 2,600 researchers worked in Borsod-Abaúj-Zemplén County in 2018, compared to the only 199 in Nógrád. Looking at the changes, all regions have experienced stagnation or lower growth rates since 2005, which, combined with the previous research sites data, results in a decline in the number of researchers per research site in some regions, including the Northern Hungary region. The specific number of R&D personnel in the Central Hungary region is outstanding in European comparison as well, since 2002 it has been among the best (Eurostat, 2005).

In terms of R&D expenditures, the country is more centralized than in the previous cases, as 66.9% of the expenditures were concentrated in the central region in 2018. The Northern Hungary region had the second lowest proportion (3.2%) among the regions of the country, ahead of the Southern Transdanubian region, due to the extremely low values of Heves and Nógrád counties *(Table 4)*.

Table 4:
Research and development expenditure in each region and in counties of the Northern Hungary region

	Research and development expenditures (million HUF, current prices)				Research and development expenditures (% of total)			
	1996	**2000**	**2010**	**2018**	**1996**	**2000**	**2010**	**2018**
Central Hungary	29311	73254	202588.6	434233.1	68.9	70.3	66.5	66.9
Central Transdanubia	2415	5229	16476.9	56933.6	5.7	5.0	5.4	8.8
Western Transdanubia	1218	2949	15532.3	33042.5	2.9	2.8	5.1	5.1
Southern Transdanubia	1306	3918	7927.6	17500.1	3.1	3.8	2.6	2.7
Northern Hungary	1268	2504	11354.3	20947.7	3.0	2.4	3.7	3.2
Northern Great Plain	3068	8144	27320.5	39393.1	7.2	7.8	9.0	6.1
Southern Great Plain	3979	8201	23616.5	46764.4	9.3	7.9	7.7	7.2
Borsod-Abaúj-Zemplén	899.6	1857.2	7147.7	14212.4	2.1	1.8	2.3	2.2
Heves	355.1	745.4	3399.3	5167.4	0.8	0.7	1.1	0.8
Nógrád	14.4	39.9	807.3	1568	0.0	0.0	0.3	0.2

Source: own compilation based on the HCSO data

The structure of expenditures in the Northern Hungary region changed after 2000, and there was a significant reorganization/reallocation process among the different sectors. The share of R&D spending in the higher education sector (46.8% in 2000) dropped to 21.6% by 2017, which is roughly equivalent to the EU average, while the corporate sector spending increased significantly from 45.1% to 77.7%, which is higher than the EU average. The remaining 0.7% was held by the government sector in 2017 (down from 8% 17 years earlier). According to the HCSO (2017), between 2014 and 2016 the proportion of innovative enterprises in the Northern Hungary region reached 28.4%, following only Budapest (34.4%) and the Western Transdanubia region (28.9%).

In terms of R&D expenditure as a percentage of the GDP, the region is one of the least developed areas (0.49%). At the same time, it should be noted that none of the Hungarian regions reached the EU average (2.07% in 2017) and the national value is also relatively low compared to international standards. An overview of the changes shows that all Hungarian regions had increasing R&D expenditures after 2000, but in most cases persistent differences are seen among the regions *(Figure 4)*, even though sigma convergence seemed to be achieved between 2000 and 2017, as the CV indicator (coefficient of variation) has been decreasing since 2000.

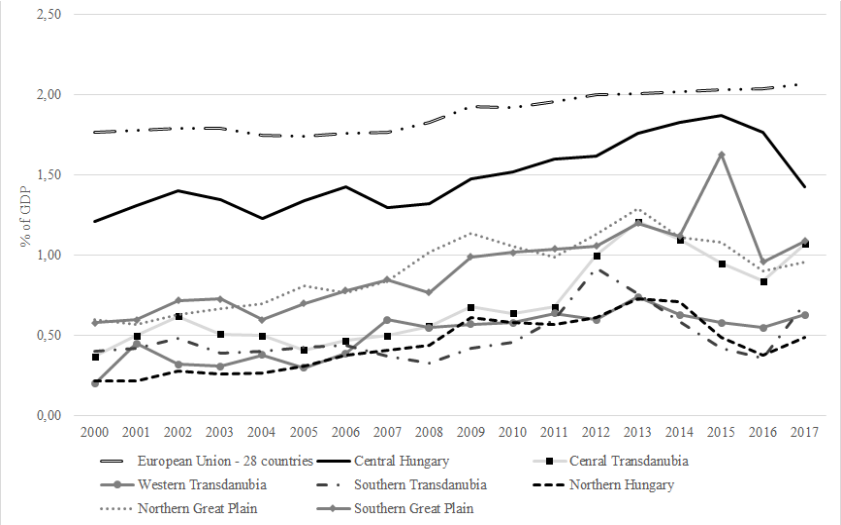


Figure 4: R&D expenditures as a percentage of GDP (2000-2017)
Source: own compilation based on the Eurostat data

Output side factors

There are significant inequalities in the number of patent applications per million inhabitants across the EU along a western-eastern slope. In this indicator, besides the advanced area of the blue banana there is another highly developed territory, the Swedish-Danish-German "boomerang". The areas with the most patent applications can be identified in these areas, with the city of Erlangen having the highest value, with an average of 1,770.5 patents per million inhabitants based on the Eurostat data *(Figure 5)*.

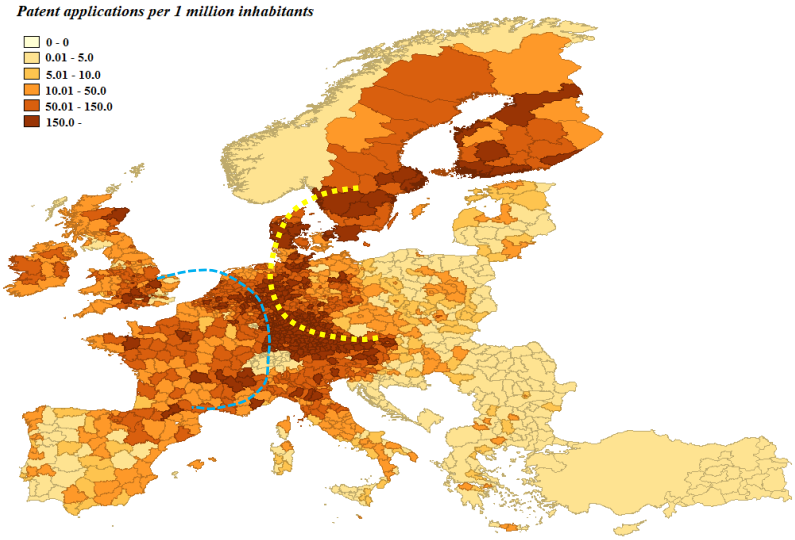


Figure 5: Number of patent applications per million inhabitants in the European Union (NUTS3, 2013)
Source: own compilation based on Eurostat data
Note: the blue line indicates the blue banana territory, while the yellow line is the Swedish-Danish-German "boomerang"

The lowest values are concentrated in the southern and eastern peripheries of the European Union. Apart from zero values, two Romanian regions have the fewest patent applications per 1 million inhabitants: Arges (0.409) and Mures (0.309). The number of patents is also low in the counties of the Northern Hungarian region, with an average of 1-5 patents per million inhabitants (Szendi and Papp 2017).

The patent disparities are also shown in the graph of the next Local G_i index, which represents the hot and cold spots in the European Union *(Figure 6)*. The Local G_i indicator is the local measure of autocorrelation created by Getis and Ord (1992). G-statistics can take values between 0 and 1 (Abdulhafedh, 2017). Positive G_i indicates the local concentration of hot spots, while negative G_i indicates the local concentration of cold spots. It is important to note that G statistics do not take into account the spatial outliers (Anselin, 2016). The data suggests that the southern German provinces form a continuous hot spot area, while the central and eastern European countries (including two counties of the Northern Hungary region: Borsod-Abaúj-Zemplén and Nógrád) form a cold spot area.

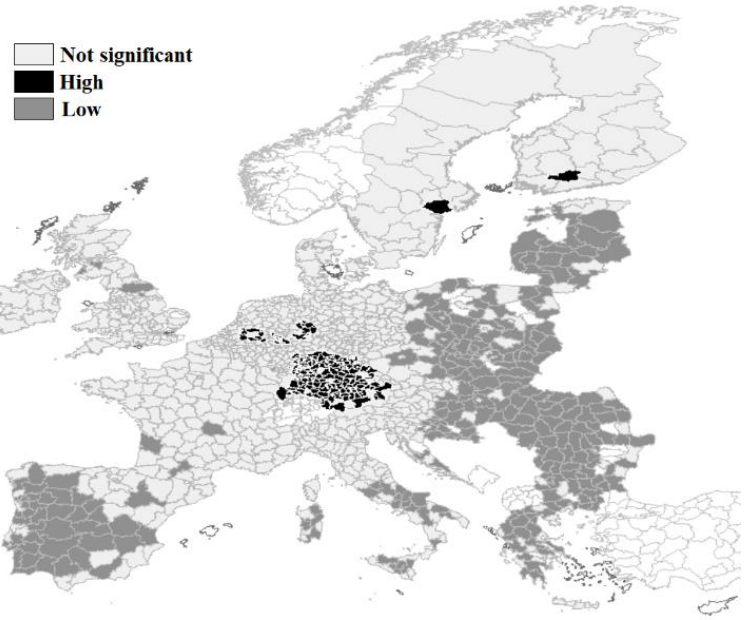


Figure 6: Territorial autocorrelation of patent applications per million inhabitants
Source: own compilation based on the Eurostat data

In Hungary, the territorial concentration of R&D activity is well illustrated by the fact that there are significant regional differences in the number of patent applications per 1 million inhabitants. The dominance of the Central Hungarian region is clear, but at the end of the list there was a significant shift in the 2000-2012 period. Until 2006, the regions were close to each other, but after that the Western Transdanubia and Northern Great Plain regions showed slight decreases, so the inequalities began to increase *(Figure 7)*.

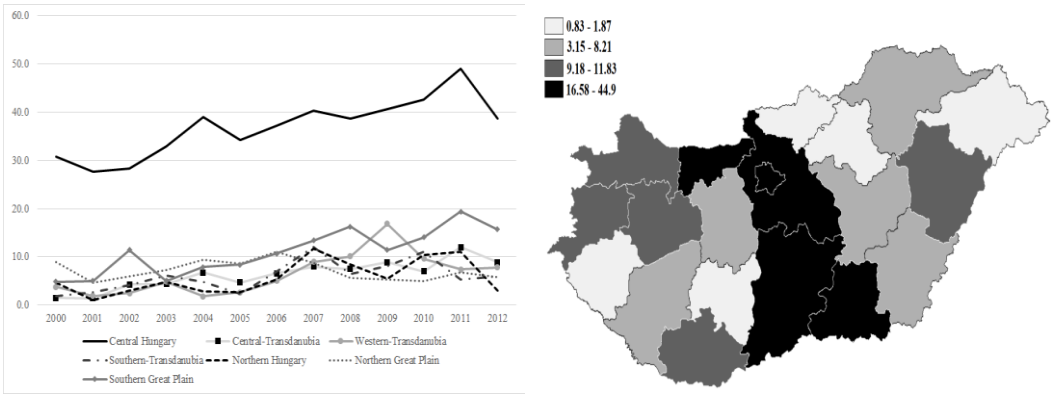


Figure 7: The number of patent applications per million inhabitants (2000-2012, left) and its spatial concentration (2012, right)
Source: own compilation based on the HCSO data

In 2012, the largest number of patent applications were created in the capital and Pest County, as well as in Komárom-Esztergom, Bács-Kiskun and Csongrád Counties. In Europe, the Northern Hungary region is one of the moderate innovators, with an average of 1-5 patents per million inhabitants (Szendi and Papp 2017).

There is a strong Central Hungarian concentration also in the number of Hungarian and international academic publications per 1,000 inhabitants, where between 2005 and 2018, approximately 7-8 publications per 1,000 inhabitants are created. In contrast, the other regions are lagging behind this significantly (with values lower than four). The Northern Hungary region is ahead of the Central Transdanubia region with a publication value of around 1.5 per 1,000 inhabitants.

5. Complex evaluation of the Northern Hungarian region's innovation potential

The innovation potential, as can be seen from the above, is a complex notion that can be described by several factors together. Grosz and Rechnitzer (2005) carried out a complex ranking system for the innovation potential of the subnational territorial units. This is based on three criteria: number of R&D sites, specific R&D expenditure, and number of researchers per 10,000 inhabitants. The study looked at the base years of 1995 and 2001, but in the authors' opinion, this is a short period of time for reviewing significant changes. Therefore, in this study, I compare the 1995 base to the 2018 data, following the methodological considerations of Grosz and Rechnitzer (2005). The results are summarized in *Table 5*.

Table 5:
Ranking of R&D potential for the Hungarian counties (1995, 2018)

		1995						2018			
		1	**2**	**3**	**sum**			**1**	**2**	**3**	**sum**
1	Budapest	1	1	1	3	1	Budapest	1	1	1	3
2	Csongrád	2	2	2	6	2	Csongrád	2	3	2	7
3	Hajdú-Bihar	4	3	3	10	3	Hajdú-Bihar	4	4	4	12
4	Baranya	3	7	4	14	4	Veszprém	9	2	5	16
5	Győr-Moson-Sopron	6	5	5	16	5	Győr-Moson-Sopron	5	5	6	16
6	Veszprém	8	4	6	18	6	Baranya	6	9	3	18
7	Pest	7	8	8	23	7	Pest	3	7	8	18
8	Borsod-Abaúj-Zemplén	5	11	7	23	8	Fejér	8	8	7	23

		1995						2018			
		1	**2**	**3**	**sum**			**1**	**2**	**3**	**sum**
9	Fejér	12	6	12	30	9	Borsod-Abaúj-Zemplén	7	11	11	29
10	Szabolcs-Szatmár-Bereg	9	10	11	30	10	Heves	11	13	9	33
11	Heves	10	12	10	32	11	Bács-Kiskun	10	10	13	33
12	Jász-Nagykun-Szolnok	13	13	8	34	12	Vas	16	6	12	34
13	Békés	16	9	15	40	13	Somogy	12	17	10	39
14	Vas	11	17	14	42	14	Komárom-Esztergom	17	12	14	43
15	Somogy	17	14	13	44	15	Zala	14	16	15	45
16	Bács-Kiskun	14	15	16	45	16	Szabolcs-Szatmár-Bereg	13	19	16	48
17	Tolna	18	16	18	52	17	Tolna	19	14	18	51
18	Zala	15	19	19	53	18	Békés	15	20	17	52
19	Komárom-Esztergom	18	18	20	56	19	Jász-Nagykun-Szolnok	18	15	19	52
20	Nógrád	20	20	16	56	20	Nógrád	20	18	20	58

Source: own compilation based on HCSO data

Note: 1. number of R&D sites, 2. R&D expenditure per person, 3. number of researchers per 10,000 inhabitants.

Based on the data of *Table 5*, it can be stated that the three counties in the leading position (Budapest, Csongrád and Hajdú-Bihar) maintained their position in the aggregate ranking, but they performed a bit worse than before in the individual indicators. Veszprém and Baranya Counties have changed their positions due to the fact that Veszprém County has significantly improved its specific R&D expenditure. Borsod-Abaúj-Zemplén county ranked 9th among the counties, despite the fact that it significantly improved its ranking in the number of research sites (however, there was a significant decline in the R&D expenditures). Heves County is ranked 10th in the rankings, which means that the two counties above are among the medium-developed ones, but the third county of the region (Nógrád) is in last place of the ranking in both years, worsening its overall score by 2018. In terms of the ranking, the situation of 3 counties improved significantly (Bács-Kiskun and Komárom-Esztergom improved 5 places and Zala 3 places). The largest declines were shown by Jász-Nagykun-Szolnok (a decrease of 7 places), Békés (5 places) and Szabolcs-Szatmár-Bereg (6 places). I have also examined the changes in the R&D performance and the GDP/capita relative to each other, which can be seen in the currently examined 1995-2018 time series in *Figure 8*.

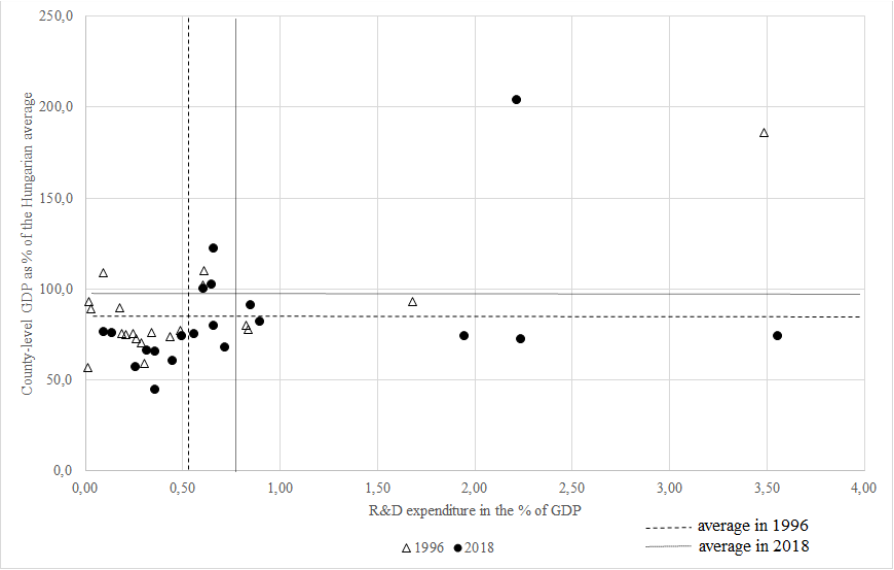


Figure 8: The situation of counties in terms of their R&D and GDP share (1996, 2018)
Source: own compilation
Note: based on Grosz and Rechnitzer (2005) 1. (upper left field): Strong economic potential and moderate R&D capacity; 2. (upper right field): Strong economic potential and favorable R&D capacity; 3. (bottom left field): Weak economic potential and moderate R&D capacity; 4. (bottom right field): Weak economic potential and favorable R&D capacity.

Table 6:
Changes in the position of counties by the share of R&D and GDP (1996, 2018)

1996			**2018**		
	Moderate R&D	**Strong R&D**		**Moderate R&D**	**Strong R&D**
Strong economic potential	Vas, Zala, Komárom-Esztergom, Tolna	Győr-Moson-Sopron, Fejér, Csongrád, Budapest	**Strong economic potential**	Komárom-Esztergom, Fejér, Győr-Moson-Sopron	Budapest
Weak economic potential	Nógrád, Szabolcs-Szatmár-Bereg, Borsod-Abaúj-Zemplén, Somogy, Pest, Baranya, Heves, Jász-Nagykun-Szolnok, Bács-Kiskun, Békés	Hajdú-Bihar, Veszprém	**Weak economic potential**	Nógrád, Szabolcs-Szatmár-Bereg, Borsod-Abaúj-Zemplén, Somogy, Pest, Baranya, Heves, Jász-Nagykun-Szolnok, Békés, Vas, Zala, Tolna	Csongrád, Hajdú-Bihar, Veszprém, Bács-Kiskun

Source: own compilation

We can see from *Table 6* that there has been a slight shift in the position of the counties in terms of R&D performance and GDP share. All three counties in the Northern Hungary region are classified as having a weak economy and a low level of R&D performance. For some counties, the change in R&D has resulted in a significant shift, so in the case of Bács-Kiskun County, due to improved R&D performance, the county can be classified in a better cluster in

2018 than before, while Fejér and Győr-Moson-Sopron Counties have lost their positions (*Figure 9*).

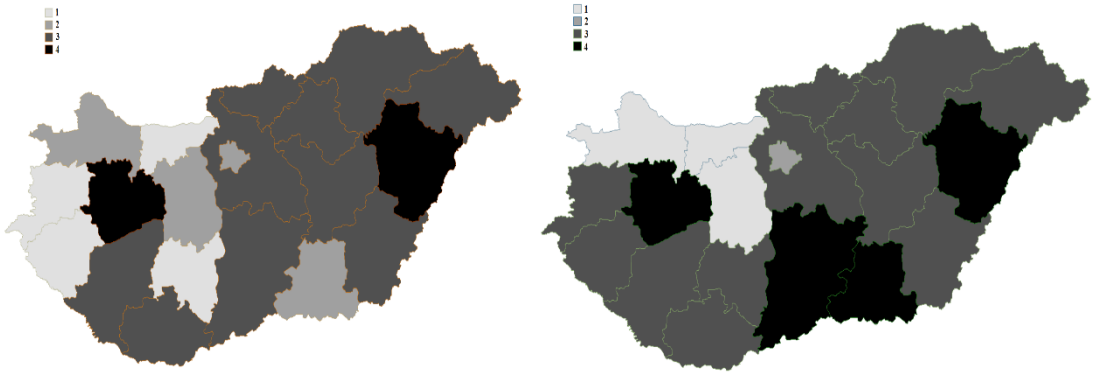


Figure 9: Change in counties' positions based on R&D and GDP share (1996 – left, 2018 – right)
Source: own compilation
Note: based on Grosz – Rechnitzer (2005) 1. Strong economic potential and moderate R&D capacity; 2. Strong economic potential and favorable R&D capacity; 3. Weak economic potential and moderate R&D capacity; 4. Weak economic potential and favorable R&D capacity.

6. Discussion

From the analysis of the input and output side dimensions of the R&D activity it can be stated that the situation of the Northern Hungary region is clearly unfavorable compared to the other regions of Hungary and also in EU comparison. In terms of the number of research and development sites, the number of their employees, the R&D expenditures in the proportion of GDP, and the patent applications per million inhabitants, the region is one of the most disadvantaged regions in the country. At the same time, some favorable trends have been observed in the recent period, mainly in comparison with the EU data, as the overall innovation score has improved compared to 2011, mainly in non-R&D innovation expenditure and employment in high-tech manufacturing and knowledge intensive services. The disadvantage of the region can be the result of several parallel effects, one of which is that some multinational companies operating in the region do not report their performance in this region, so in many cases statistical records are distorted and we do not see the exact picture.

The recent positive changes in the region are strengthened by the fact that the share of corporate sector R&D expenditures has increased significantly, which supports the legitimacy of bottom-up initiatives and also contributes to a better innovation environment. Between 2014 and 2016, according to the HCSO (2017), the proportion of innovative enterprises of the Northern Hungary region was the third highest among the Hungarian regions. This is important, as the traditional concept is that the innovation process is closed and innovation is essentially centered around research centers and large companies, but nowadays dynamic small and medium-sized enterprises (SMEs) and business-to-business networking are becoming more and more important (Márton, 2004, p. 127).

Innovative small and medium-sized enterprises have significant importance for the economic growth of a given region (Lovas and Rába, 2013). At the same time, supporting the innovation activities of these companies requires a huge amount of capital, but SMEs have limited resources to self-finance this innovation activity. The so-called venture capital financing, which is a special form of investment in innovation, requires the establishment of venture capital

funds, which act as an intermediary between venture capitalists and senior management of innovation firms, and provide opportunities for start-ups in the innovation process (Prime Minister's Office, 2016; Lyasnikov et al. 2017). The experience of Western European countries also shows that there is a strong correlation between the growth of innovation activity of small and medium-sized enterprises and the availability of venture capital funds (Lyasnikov et al. 2017). A good example is the German state of Baden-Württemberg, which has several districts (e.g. Tübingen, Stuttgart, and Karlsruhe) that are among the best performing regions according to the latest Regional Innovation Scoreboard data. In that province there are many so-called accelerator organizations that provide support to start-ups on various topics in partnership with the Chambers of Commerce and Industry. In addition, L-Bank, the state bank of Baden-Württemberg, provides support programs and financing concepts for start-ups. The Seed Fund BW, together with the Federal High Technology Fund, finances up to EUR 100,000 for start-ups in an active partnership (startupbw.de, 2020).

In addition, technology parks, incubator organizations and clusters play an important role in the innovation process (Lyasnikov et al. 2017; Saridakis, 2019). A science and technology park is an industrial park created or operated primarily to promote the development of knowledge-intensive enterprises engaged in technological innovation (Government of Hungary, 2016). According to the most recent data, there are 29 industrial parks and 30 clusters operating in the Northern Hungary region, which have higher than the average export activity, the distribution of which is shown in *Figure 10* below.

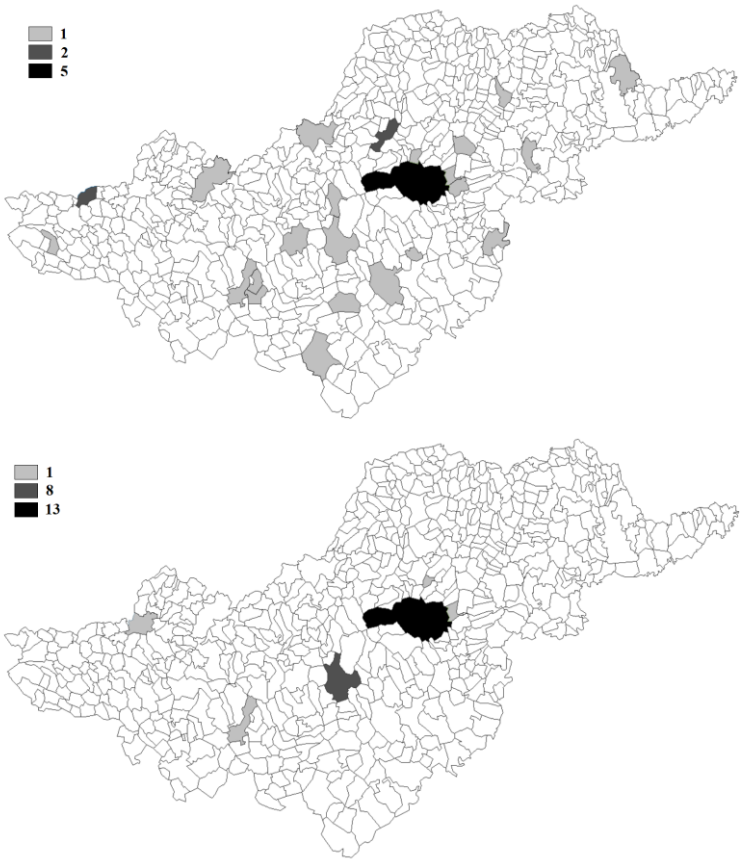


Figure 10: Location and number of industrial parks (top) and clusters (bottom) in the Northern Hungary region
Source: own compilation

It can be said that there is a significant spatial concentration in the location of both industrial parks and clusters; they are concentrated in the vicinity of big enterprises.

7. Summary

Research and development is a key factor for regional development and competitiveness. Therefore, in this study I have examined the role of R&D potential and its changes in the Northern Hungary region. Findings show that while the region holds 11.2% of the Hungarian population and has 7.97% of the GDP, its weight in R&D (3.2%) is far below its economic situation or population share. In most of the indicators examined, the region is one of the most disadvantaged within the country and can only be classified as a moderate innovator in international comparison. Another problem is that venture capital does not play an important role in the regional innovation environment, and the industrial parks and clusters also show strong concentration, which does not support the innovation activity of the enterprises.

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Entrepreneurship and Economic Growth – Conceptualization Choices in the Literature[4]

The literature agrees that entrepreneurship is linked to economic growth. Most research in this area seems to underline the positive relationship between the two. However, empirical studies often lead to little or even negative correlation. One of the reasons for the divergent research results is the differences in definitions and approaches used. The purpose of this article is to examine the definitions and conceptual models used in the literature and to show that there is no consensus among researchers. This fact suggests that great care is needed when evaluating and comparing research results from different sources.
Keywords: entrepreneurship, economic growth, economic development
JEL code: P42

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Introduction

The impact of entrepreneurship on economic growth and development has received considerable attention in the last few decades. It is linked to economic growth primarily through innovation, value creation and employment, but a number of other aspects (such as self-realization, market structure effects) are also at the center of interest. Nevertheless, empirical studies on the role of entrepreneurship in economic growth show mixed evidence (Stam 2008). This is partly due to the fact that each author uses different definitions, and the studies also use different variables and conceptual frameworks, making it almost impossible to compare the results of each work. To get an in-depth understanding of the question this paper aims to review the existing literature about entrepreneurship. The empirical evidence will be useful in identifying key ideas about the role of entrepreneurship in growth and in comparing the main results of these works. In addition, it will assist in finding further research topics and in selecting the most beneficial methodology. The structure of the study is the following: first the various ways in which entrepreneurship has been defined are introduced. This is followed by different structural frameworks for linking entrepreneurship to growth.

Entrepreneurship definitions

A unified definition of entrepreneurship has not yet been defined in the literature. Analysing and comparing various definitions is the first step in understanding the phenomenon.

The word entrepreneurship originated from the eighteenth century and was obtained from the French word "entrepreneur", which originally means someone who takes on a project or activity. Richard Cantillon[5] was the first to use this expression and in his work entrepreneurs were the prime directors of resources. Their occupations come with risks due to uncertainty, especially from competition and changing tastes. Hébert and Link (1989) analysed the entrepreneurship concept through three major intellectual traditions: the German Tradition (Thünen and Schumpeter), the Chicago Tradition (Knight and Schultz) and the Austrian

[4] The described article was carried out as part of the EFOP-3.6.1-16-2016-00011 "Younger and Renewing University – Innovative Knowledge City – institutional development of the University of Miskolc aiming at intelligent specialisation" project implemented in the framework of the Szechenyi 2020 program. The realization of this project is supported by the European Union, co-financed by the European Social Fund.

[5] Cantillon completed his manuscript in 1730, but it was published only in 1755 and even then, it was published anonymously under the name of a defunct foreign publisher. The influence of Cantillon's manuscript was largely unknown and the book had fallen so far into neglect that William Stanley Jevons was said to have "rediscovered" it in the late 19th century (Cantillon 2010, p.15). For the English translation see: Cantillon 2010.

Tradition (Mises, Kirzner and Shackle), all of which are based on Cantillon's work, and created a "synthetic definition" of entrepreneur. They emphasize that entrepreneurship has a place in the world of economic dynamics and this fact brings aspects like imperfections, uncertainties, risk into the concept. During the conceptualization process we may sacrifice realism to gain precision. How much we can do this depends on what we want to achieve, to understand the foundations of economic life or to predict the course of events.

Maybe this trade-off is the reason why nowadays the discussion of entrepreneurship is complicated by its very complex nature and its lack of uniform definition. According to Kao (2002), entrepreneurship is a process in which something new or novel is created that serves the well-being of the individual, while also creating value for society However, entrepreneurship does not necessarily take the form of setting up a new business. As defined by the European Commission, entrepreneurship is a way of thinking, creating and developing an economic activity, combining risk-taking, creativity and/or innovation with appropriate management, within a new or existing organization (EC, 2003). In this sense, entrepreneurship can also be found within companies. The concept of intrapreneurship (Wennekers and Thurik 1999) or corporate entrepreneurship (Bouchard and Fayolle 2018) refers to the desire of large companies to achieve higher performance by increasing their entrepreneurial spirit. In increasingly turbulent and global environments, established firms cannot survive unless they are ready to be entrepreneurial (Bouchard and Fayolle 2018). Finally, the term "interpreneurship" implies that the entrepreneurial atmosphere and activities found in a family business are inherited from generation to generation (Kao 2002).

The concept of entrepreneurship has been extended with a new dimension, which is also of great importance today: social entrepreneurship. The key elements of this are public interest, social innovation and social justice (EC 2011). A social enterprise can be any type of organization as long as it has a social purpose and demonstrable social impact, as well as revenue from the market, sales or service provision (G. Fekete et al. 2017, Bereczk 2018).

It can thus be seen that the definition of entrepreneurship can be very varied. In the following, we attempt to examine what the focus of each definition is, and how the authors see the essence of the concept. We found three major focuses in the literature: entrepreneurship as the driver of innovation, entrepreneurship as opportunity recognition and entrepreneurship as the start-up process.

Entrepreneurship as innovation

According to Schumpeter (1980), entrepreneurs are the main triggers for economic development. He defines development as "the realization of new combinations" (Schumpeter 1980, 111), and the individuals whose function it is to carry them out are called entrepreneurs.
These new combinations (new products, new markets, new materials, and new forms of organizations) are the innovations themselves, according to Madarász (1980), there is a reciprocal and clear correspondence between innovation and entrepreneur in Schumpeter's work.
Drucker (1985) sees innovation as a specific tool of entrepreneurs, "the means by which they exploit change as an opportunity for a different business or a different service" (p. 19). Entrepreneurs need to search purposefully for the sources of innovation, the changes and the entrepreneur always searches for change, responds to it, and exploits it as an opportunity.
Miller distinguishes entrepreneurial and non-entrepreneurial firms. According to him, an entrepreneurial firm is one that "engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with "proactive" innovations, beating competitors to the punch" (Miller, 1983, p. 771). Meanwhile, he also emphasizes that entrepreneurship integrally related to variables of environment, structure, strategy, and leader personality.

Entrepreneurship as opportunity recognition

Other authors see opportunity recognition as a key element of the entrepreneurship concept. One scholar who is well known for acknowledging the concept of opportunity as a major element of entrepreneurship is Kirzner. As he wrote, "Entrepreneurship does not consist of grasping a free ten-dollar bill which one has already discovered to be resting in one's hand; it consists in realizing that it is in one's hand and that it is available for the grasping" (Kirzner 1973, p. 47).

According to Drucker (1985) the entrepreneur always searches for change, responds to it, and exploits it as an opportunity – this defines entrepreneur and entrepreneurship. In his view, innovation is a possible tool that helps exploit opportunities. Stevenson and Jarillo (1990, p.23) define entrepreneurship as frame of mind "by which individuals – either on their own or inside organizations – pursue opportunities without regard to the resources they currently control". This definition puts the focus on entrepreneurship as the pursuit of opportunity irrespective of organizational context (Brown et al. 2001). According to Shane and Venkataraman (2000), to have entrepreneurship, first entrepreneurial opportunities are needed. As the authors emphasize, the discovery of an opportunity is a necessary condition for entrepreneurship, but it is not sufficient – the decision about exploitation of the opportunity is also needed. They also state that entrepreneurship does not require, but can include, the creation of new organizations.

Entrepreneurship as self-fulfillment

The above approaches implicitly assume that entrepreneurship is driven to achieve business successes and the process itself is cognitive. However, some authors approach entrepreneurship from a behavioral point of view and emphasize its role of need for self-fulfillment (development, learning, meeting one's own challenge), independence and value creation in the entrepreneurial process. For example, Hamilton's calculations (2000) revealed that entrepreneurs had lower initial earnings, lower earnings growth and other disadvantages, and for them self-employment offers significant nonpecuniary benefits.
Founders who are driven by intrinsic (instead of extrinsic) motivation or who start a business to combine responsibilities, are better able to cope with stress and are more satisfied with their leisure time (Carree and Verheul 2012).

The GUESSS research[6] (Global University Entrepreneurial Spirit Survey) is the largest international collaboration dealing with entrepreneurial intention and student entrepreneurship that also addresses the individual level motivational factors (motives, preferences, social identity).

Entrepreneurship as business creation

Measuring opportunity recognition, innovation or motivational aspects of entrepreneurship is problematic. There is no question that the approaches described above (innovation, opportunity recognition, self-fulfillment) are relevant to the definition of entrepreneurship, but the enterprise- or individual- level approaches pose serious barriers to measurability, while business creation is easy to measure and easy to compile statistics about.

In part, perhaps, this is why some researchers identify entrepreneurship as setting up a new business. According to Lumpkin and Dess (1996) the essential act of entrepreneurship is new entry. This is a more measurable and quantitative way of definition. A typical example of it is the entrepreneurship definition of the Global Entrepreneurship Monitor (GEM). According to GEM, entrepreneurship is "any attempt at new business or new venture creation, such as self-employment, a new business organization, or the expansion of an existing business, by an individual, a team of individuals, or an established business" (GEM Reports).

[6] The website of the research: http://www.guesssurvey.org/

The peculiarity of GEM research is that it deals not only with those who are already actually entrepreneurs, but also by examining entrepreneurial attitudes from the birth of the first ideas (nascent entrepreneurship).

The role of entrepreneurship in economic growth – models available in the literature

In the following, we will provide examples of what models and concepts the authors use to explain the relationship between entrepreneurship and economic growth. As we will see, the central elements of these can also be very diverse as is the methodology. Some researchers look at the relationship between business and economic growth by analyzing statistical data, others by relying on meta-analysis, and still others by extending existing macro-models.

Entrepreneurship: opportunity or necessity

It is very important what motivations the entrepreneur has. The difference between the performance and viability of a businesses created to take advantage of a good business opportunity and a business created because no better option exists can be significant. This is not only true at micro level. Whether the former, or the latter, is more characteristic of an economy is also decisive in terms of the impact of entrepreneurship on economic growth. GEM pays attention to these differences in motivations for starting a business and created separate measures of opportunity and necessity entrepreneurship[7]. These measurements allow a more accurate assessment of the relationship between entrepreneurship and economic growth.

Acs and Varga (2005) found that only opportunity entrepreneurship has a positive and significant effect on economic growth. Acs (2006) created an opportunity-necessity entrepreneurship ratio (using GEM data) and found a positive relationship between GDP per capita level of economies and this entrepreneurship ratio. Furthermore, he emphasized that self-employment, either in agriculture or in very small-scale industry, will not lead to economic development because there is no mechanism to link the activity to development.

Entrepreneurship and the stages of the development

At different stages of economic development, the nature of entrepreneurship (its motivations, size of the firm, etc.) and its contribution to economic growth vary. At low levels of national income, self-employment provides job opportunities. With increasing GDP per capita income, the emergence of new technologies and economies of scale allow larger and established firms to satisfy the increasing demand of growing markets and to increase their relative role in the economy. At the same time, the number of business start-ups decreases as people find stable employment. Finally, as further increases in income are experienced, the role played by the entrepreneurial sector increases again, as more individuals have the resources to go into business for themselves in a business environment that allows the exploitation of opportunities (Acs 2006). Policies and conditions also have to differ according to the actual development stage of the country.

The Global Competitiveness Report emphasizes that countries face challenges and priorities during the transition of economic development. It identifies three stages of development: the factor-driven stage, the efficiency-driven stage and the innovation-driven stage (Porter et al. 2002). Acs and Szerb (2009) showed the role of entrepreneurship during the different stages of development (Figure 1). The S-curve in the figure 1 suggests that in the factor-driven stage a relatively small amount of entrepreneurial activity is productive, that is, creates economic and/or social value. This increases sharply through the efficiency-driven stage and levels off in the innovation-driven stage of development. As institutions are strengthened, more entrepreneurial

[7] See the research website: https://www.gemconsortium.org/

activity is shifted towards productive entrepreneurship strengthening economic development (Acs and Naudé 2012).

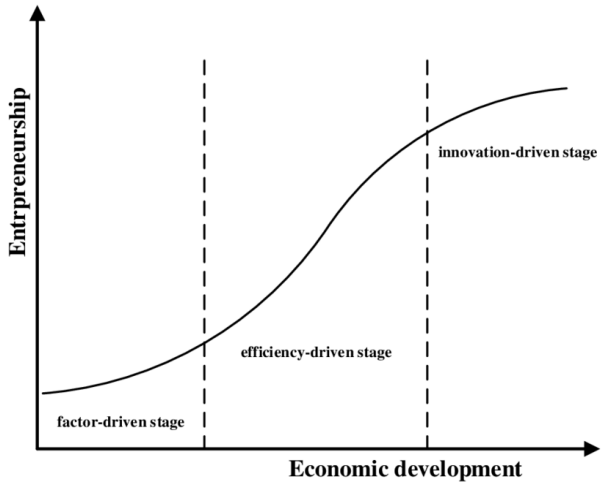

Figure 1. Entrepreneurship and the corresponding stages of economic development
Source: Acs and Szerb, 2009, p.10

By reviewing the literature on the relationship between development and entrepreneurship, Acs et al. (2008) came to the conclusion that the impact of institutional arrangements on various types of entrepreneurial activity may differ depending on a country's level of economic development. Countries in the factor-driven stage should focus on achieving stable institutional and macro-economic environments and increase entrepreneurial capacity, e.g., by enabling individuals and businesses to absorb knowledge spillovers. For countries in the innovation-driven stage, policy makers can positively affect entrepreneurship, including several ambitious types of entrepreneurship, by fostering entrepreneurship education and training, by stimulating outward FDI and international trade to facilitate export spillovers and by supporting role models.

According to the authors, a major shortcoming of GEM data has been the fact that it has not been able to effectively deal with the 'issue' of how to compare entrepreneurial activity in developed and developing countries. For example, low-income countries, such as Uganda, Peru and Ecuador, have very high levels of self-employment and therefore, have high levels of entrepreneurial activity as measured by the GEM program. High-income countries like Japan, Sweden and Germany have much lower levels of entrepreneurial activity as measured by the GEM program (Ács et al. 2008).

Van Stel et al. (2004) also used the GEM data of 34 countries to understand the relationship between growth and entrepreneurship. They found a significant non-linear effect: the Total Entrepreneurial Activity (TEA) rate[8] has a negative effect for the relatively poor countries, while it has a positive effect for the relatively rich countries. The results show that entrepreneurship matters; however, the effect of entrepreneurial activity highly depends on the level of development.

Entrepreneurship in the production function

The neoclassical model of the production function of Solow linked factors of production, labour and capital to output (Solow 1956). Romer and others have expanded the model to include

[8] The total entrepreneurial activity rate (TEA) is defined as that percent of adult population (18-64 years old) that is either actively involved in starting a new venture or the owner/manager of a business that is less than 42 months old (Reynolds et al. 2002).

measures of knowledge capital. Audretsch and Keilbach (2004) introduce a new factor into the model, this is entrepreneurship capital. Entrepreneurship capital is the capacity for economic agents to generate new firms. According to the authors, entrepreneurship capital "can contribute to output and growth by serving as a conduit for knowledge spillovers, increasing competition, and by injecting diversity" (Audretsch and Keilbach 2004, p. 9).

Using a specification of the Cobb-Douglas function, the authors created the following equation:

$$Y = \alpha K_G^{\beta 1} L_G^{\beta 2} R_G^{\beta 3} E_G^{\beta 4} e^{ei} , \qquad (1)$$

where

Y is measured as Gross Value Added corrected for purchases of goods and services, VAT and shipping costs,

K is the stock of capital used in the manufacturing sector,

L is labour (using data published by the Federal Labor Office),

R represents knowledge capital and was expressed as number of employees engaged in R&D in the public and in the private sector,

E is the entrepreneurship capital, computed as the number of start-ups in the respective region relative to its population, which reflects the propensity of inhabitants of a region to start a new firm.

G refers to Germany, where data was obtained from 327 German regions to undertake the study.

As the positive and statistically significant coefficients suggest, both physical capital and labor are important factors of production in determining output in German regions.

According to the calculations of the authors, entrepreneurship is a key factor in explaining variations in output across German regions. Regions with a greater degree of entrepreneurship capital have higher levels of output. Entrepreneurship capital is an important addition to the model of the production function. They also found that regions with higher entrepreneurship capital exhibit systematically higher levels of labor productivity. The authors believe that policies focusing on enhancing entrepreneurship capital can prove to be more effective than those targeting the more traditional factors (Audretsch and Keilbach 2004).

Entrepreneurship and institutions

The models presented above were macro models. They tried to describe the relationship between economic growth and entrepreneurship on the basis of macro or aggregated data. Accordingly, the definition of entrepreneurship has lost much of its complexity during the operationalization, in many cases being matched with the available enterprise statistics (number or proportion of enterprises). Below we present models that emphasize the need for simultaneous examination of the micro, meso and macro level due to the interdependencies and synergies between them.

Wennekers and Thurik, based on an overview of the literature, created a complex model for the illustration of entrepreneurship's impact on economic development. They provide a conceptual framework of three levels of analysis: individual, firm and macro-economic level (Figure 2).

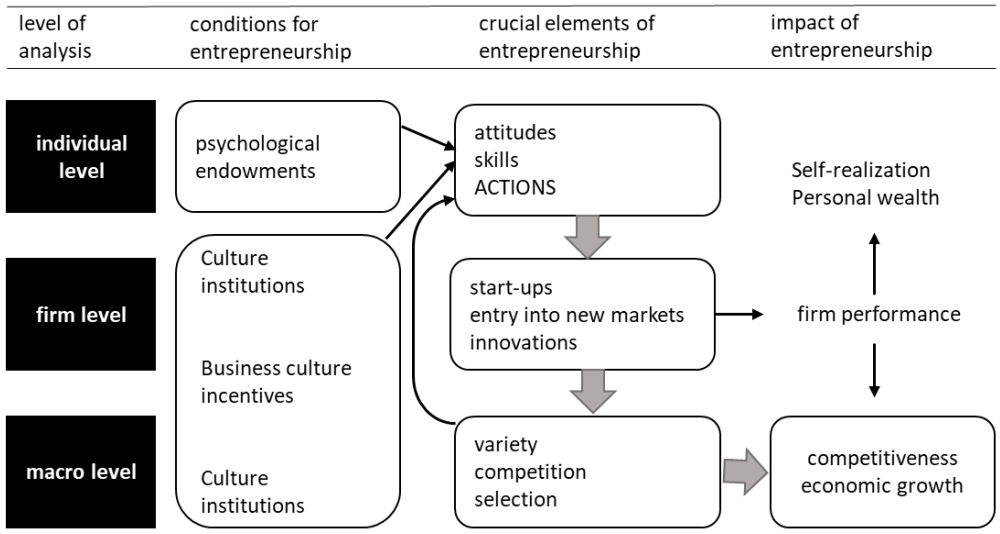

Figure 2. Framework for linking entrepreneurship to economic growth
Source: Wennekers and Thurik, 1999, p. 51

Besides psychological endowments of the population, conditions refer to the environment in which an individual carries out his or her entrepreneurial activities. It contains the national (or regional) cultural environment, and the internal culture of companies. The nature of the relationship between culture and entrepreneurship is still unknown, but according to the authors, cultural vitality, thriving sciences and a high tide in entrepreneurship often coincide. The institutional framework, both on the national level and within firms, defines the incentives for individuals to turn their ambitions into actions, and determines to what extent unnecessary barriers will hamper them. The importance of institutions for the development of entrepreneurship is paramount (Wennekers and Thurik 1999).

The model of the GEM is also worth mentioning. According to this framework, societal values about entrepreneurship include beliefs about entrepreneurship as a good career choice or the high societal status of entrepreneurs, which positively influence entrepreneurship. At the same time the ease of starting a new business promotes entrepreneurial activity. Individual attributes include demographic characteristics (gender, age, etc.), self-perceptions (perceived capabilities, perceived opportunities, fear of failure), and motives for starting a business (i.e., necessity versus opportunity). The social, cultural, political, and economic context directly influences entrepreneurship, and also indirectly affects it through societal values and individual attributes. Entrepreneurship, in turn, creates jobs and new value that then contribute to socio-economic development (GEM 2019).

Entrepreneurial activity encompasses multiple phases of the business process (nascent, new business, established business, discontinuation), potential impact (job creation, innovation, internationalization), and type of activity (such as total early-stage entrepreneurial activity or TEA, social entrepreneurial activity or SEA and employee entrepreneurial activity or EEA).

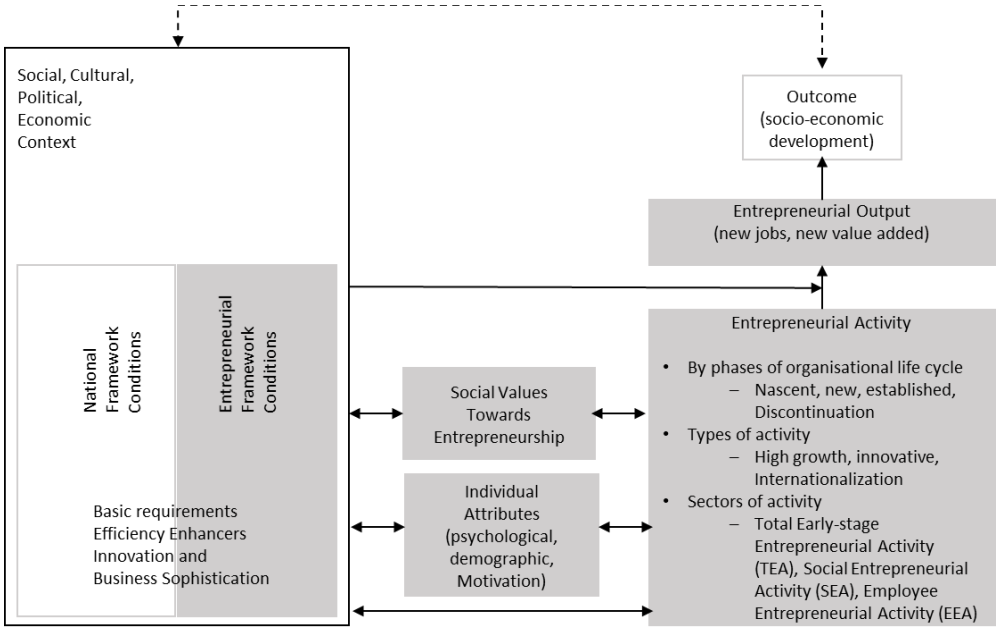

Figure 3. The GEM Framework
Source: GEM 2019

Entrepreneurial Ecosystems

Research suggests that the combined appearance of certain elements has a positive impact on business decisions and processes. The use of the term 'entrepreneurial ecosystem' is increasing in the literature (Isenberg, 2011). This term, taken from biology, refers to the interaction between living organisms and their environment. It is able to express the importance of the environment and the operational features of a complex system of relationships by establishing a link between the individual factors and elements.

The entrepreneurship ecosystem consists of hundreds of specific elements, but according to Isenberg (2011) these can be grouped into six domains: policy, finance, culture, support, human capital and markets.

The model of the World Economic Forum (2013) proposes eight pillars considered to make up an ecosystem: accessible markets; human capital and workforce; funding and finance; mentors, advisors and support systems; regulatory framework and infrastructure; education and training; major universities as catalysts; and cultural support.

Stam and Spigel outline a new business ecosystem model that incorporates elements identified in the literature and focuses on causation between the four most important ontological levels (framework conditions, systemic conditions, outputs, and outcomes) (Stam and Spigel, 2016) in response to frequent criticisms of ecosystem models. These criticisms concern the fact that the direction of causation is unknown (typically we only know that entrepreneurship and advanced ecosystems are related) and also the way in which each factor of the ecosystem interacts is not clear.

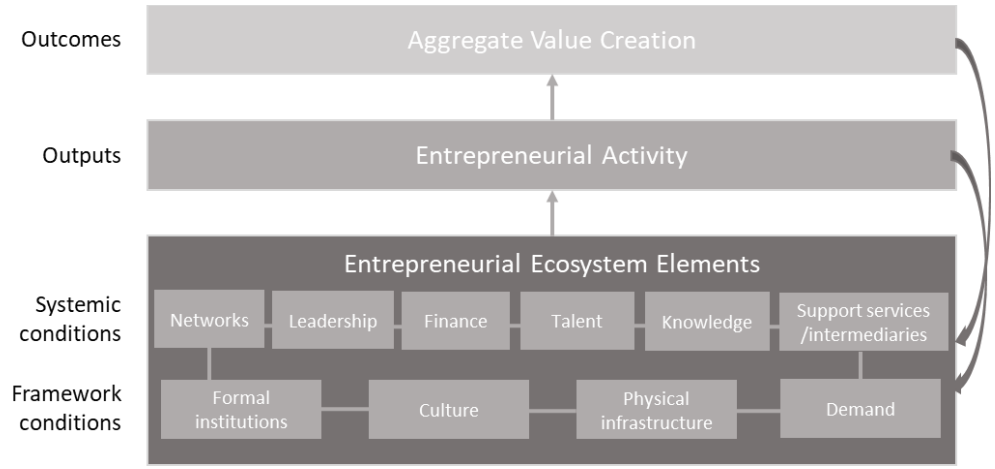

Figure 4. Key elements, outputs and outcomes of the entrepreneurial ecosystem
Source: Stam (2015) p. 1765

Examining the components of the ecosystem and evaluating their effectiveness may provide the opportunity for rational intervention, for changing the factors causing malfunctioning, namely for formulating policy recommendations (Szerb 2017). Acs et al. (2014) developed an index methodology, the Global Entrepreneurship and Development Index (GEDI), to highlight interactions between components of National Systems of Entrepreneurship that provide contextual grounding for entrepreneurial processes. According to the authors, this approach is useful in addressing the bottleneck problem of low performance of one or several constituent pillars and in focusing on the bottleneck that constitutes the weakest link amongst the pillars" (Acs et al. 2014, p.491). In 2016, the methodology was reviewed and renewed, leading to the index called the Global Entrepreneurship Index (GEI). The authors of the methodology view entrepreneurship as a concept of quality rather than quantity and they consider that both institutional and individual factors are vital in measuring entrepreneurship (Szerb et al. 2018).

Conclusion

Research results on the role of entrepreneurship in economic growth are often contradictory, a fact that is well known. By presenting some definitions of entrepreneurship and some conceptual frameworks, we were able to clarify that this is partly due to the fact that authors work with very different entrepreneurship concepts and develop different solutions during the operationalization. Some authors approach entrepreneurship with innovation, others with opportunity recognition, and others with a complex approach such as a combination of different factors like innovation, proactivity, risk-taking, development of new products, etc.

The complexity of approaches also raises measurement difficulties. First, the question is how to measure these factors credibly and how to transform them into macro data. The approaches whereby entrepreneurship is defined as running a business are easier to quantify. The advantage of these approaches is clearly that there is no obstacle to operationalizing the definition. While the macroeconomic measurement of innovation or opportunity recognition is a serious obstacle to making the concept measurable, measuring entrepreneurship as an entrepreneurial activity is very simple. We often encounter in the literature the problem that the authors apply a complex nominal definition (opportunity recognition, innovation, etc.) and then turn to a very simple operational definition (business density, ratio of start-ups) during the measurement.

Beside the individual aspects there are many other determinants that have a significant influence on the nature of the relationship between entrepreneurship and economic growth.

These are often overlooked in the literature as institutional factors (institutional economics), and sometimes we find the ecosystem approach in the literature. Both emphasize that formal institutions (education, taxation, economic policy) and informal determinants (culture, norms and values) influence the relationship between economic growth and entrepreneurship. We often find that these complex approaches remain within the theoretical framework of thinking. Research that has significant resources (large research teams and financial resources) can transform these theoretical frameworks into real measurements. This is the case with GEM, which, thanks to the Adult Population Survey (APS), can measure motivations and attitudes on an individual level. Once aggregated, they can be compared with macro data and can serve as a basis for international comparison.

As long as there is no uniform definition of entrepreneurship, it is difficult to compare research results. This requires the reader to be very careful in drawing conclusions from different studies.

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Szávics, Petra

Smart Specialisation in Romania, the Growing Importance of the Regional Dimension

The main aim of this paper is to present how the importance of the Romanian regional smart specialisation strategies grew during the 2014-2020 programming period. Relevant milestones connected to the implementation of the Regional Operational Programme are presented, relying on the analyses of secondary documents. The process is interpreted based on the existing literature in order to additionally identify some bottlenecks faced by less developed regions in such processes. In the case of Romania the regional dimension gained importance mid period of the financial exercise, triggered by the need to fully meet the ex-ante conditionality applicable under Cohesion Policy. The atypical situation presented sheds light on aspects linked to lack of capacities, lack of coordination between national and regional levels and different degrees of experience at the level of regions. However, capacity gained by organisations responsible at the regional level can be capitalised on in the preparation for the 2021-2027 programming period.
Keywords: smart specialisation, Cohesion Policy, less developed regions, regional development, innovation policy.
JEL code: O20, O29, O30, O38, O39, R58, R59.

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Introduction

Smart specialisation strategies developed on the national and/or regional level became an ex-ante conditionality for the use of European Regional Development Fund in research and innovation under Cohesion Policy starting with the 2014-2020 programming period (Foray 2015). The ex-ante conditionality appeared in the Partnership Agreement of all Member States and was applicable to 169 out of 205 Operational Programmes, in the vast majority of cases being a condition applied on the regional level, linked to the elaboration of regional programmes (Tolias 2019). Of the Member States, 12 have elaborated only national level strategies, 6 decided on developing only regional strategies and 10 countries, including Romania, have elaborated both national and regional strategies (Larrea et al. 2019).

In this context, however, compared to all other Member States, Romania presents a particular case, since, only the national strategy has been officially submitted as partial fulfilment of the ex-ante conditionality[9], with the regional smart specialisation processes becoming interlinked with the use of funds only midway through the programming period (Szávics and Benedek, *forthcoming*). Additionally, this happened only in connection to the policy documents of the seven less developed regions and not in case of the capital region, Bucharest-Ilfov. Due to this particularity, the main aim of this paper is to present, as a case study, the evolution of the Romanian regional smart specialisation strategies in the context of Cohesion Policy, pointing out the most relevant milestones. Since seven out of the eight NUTS II development regions are considered less developed and five of those are also considered lagging regions, a subsequent objective is to identify bottlenecks that can be regarded as characterising such regions linked to the smart specialisation process.

The case study itself can contribute to the literature, since Romanian regional smart specialisation processes have not drawn attention in the literature, except for the case of the North East Development Region (Healey 2016) and in terms of transformations that were triggered by this process impacting regional innovation systems (Ranga 2018). Other

[9]According to Section 2.3of the Partnership Agreement of Romania approved by the European Commission on August 14, 2014, http://www.fonduri-ue.ro/acord-parteneriat#varianta-%C3%AEn-englez%C4%83.

contributions on Romania (Sandu 2012; Ionescu 2015; Drăgoiu, 2016) are focused on the national level. Additionally, the paper can bring some empirical evidence to the literature generally referring to problems and challenges faced by less developed or lagging regions linked to smart specialisation policy making. These challenges include lack of capacity of the institutions governing smart specialisation processes and of key actors participating in them and the low level of trust within the innovation system, hindering proper policy formulation (Tsipouri 2018; Kocziszky and Benedek 2018; Trippl et al. 2019; Pose and Ketterer 2019), as well as lack of appropriate multi-level coordination mechanisms (McCann and Ortega-Argilés 2016).

Besides its contribution to the literature, the paper can have some practical relevance, as well. According to a recent proposal, for the first time since Romania's accession to the European Union in 2007, all Romanian regions are preparing to elaborate and implement separate Regional Operational Programmes for the 2021-2027 programming period[10]. The assumption is that the smart specialisation processes implemented in the current programming period on the regional level have contributed to this decentralisation.

The paper starts with a literature review on smart specialisation in the context of Cohesion Policy, than continues with methodological aspects. After a short introduction to the general Romanian context, the following section will thoroughly present regional smart specialisation processes in Romania. The paper will resume with discussion and conclusions, indicating possible areas of future research.

Smart specialisation and Cohesion Policy

Smart specialisation strategies are interventions designed with the aim to facilitate economic transformation in a limited number of vertical priority areas, relying on economic assets and strengths, research capacities and use of new technologies, but at the same time on the results of entrepreneurial discovery processes, involving stakeholders with entrepreneurial knowledge in a continuous experimentation (Foray et al. 2011; Foray 2014; Foray 2015). The concept, proposed by Dominique Foray in the *Knowledge for Growth* Expert Group coordinated by the Directorate General for Research and Innovation, was transposed into an instrument of Cohesion Policy by the Directorate-General for Regional and Urban Policy, with smart specialisation strategies becoming an ex-ante conditionality for European Regional Development Fund (ERDF) expenditures made under Thematic Objective 1- *Promoting research, development and innovation* (Foray 2015). Transposal was favoured by the Cohesion Policy reform, generated by the Barca report (McCann and Ortega-Argilés 2011; McCann 2015), characterised by five important elements: a) a place-based logic with accent on the regional level, b) multi-level governance by involving partners and using a bottom-up approach, c) need for effectiveness through accent on results and impact in terms of social and economic development, d) focus on efficient use of funds through thematic concentration, e) use of ex-ante conditionalities for justifying interventions to be financed and ensuring their proper design (McCann 2015). The recommendations of this report also influenced the method of putting smart specialisation into practice in the context of Cohesion Policy.

[10]Decentralisation was first announced during November 2019, the Romanian Government adopting an Emergency Ordinance in this sense on February 4, 2020, but later on deciding on adopting the decision through a different normative act. Further information is to be found on the web-page of the Romanian Government and Ministry of European Funds: http://mfe.gov.ro/referitor-la-unele-informatii-aparute-in-spatiul-public-in-data-de-29-noiembrie-2019-ministerul-fondurilor-europene-face-urmatoarele-precizari/;http://mfe.gov.ro/cinci-ordonante-de-urgenta-in-sprijinul-cresterii-eficientei-utilizarii-fondurilor-europene/;https://gov.ro/ro/guvernul/sedinte-guvern/informatie-de-presa-privind-proiectele-de-acte-normative-adoptate-sau-de-care-guvernul-a-luat-act-in-cadrul-edintei-din-4-februarie.

To fulfil the ex-ante conditionality as stipulated in Regulation 1303/2013[11], institutions responsible for strategy elaboration could rely on the methodological guidance developed by the European Commission (European Union 2012). Based on this guidance, strategies should be based on a sound analyses of the socio-economic context and research and innovation indicators, should include priorities and a policy mix, as well as monitoring and evaluation mechanisms (ibid). However, the most important elements of good policy design are the involvement of stakeholders through entrepreneurial discovery, the vertical definition of a limited number of priorities, both depending on the quality of institutions responsible for and those participating in the process (Foray 2015). Involvement of stakeholders is not only to be assured through entrepreneurial discovery but also through the establishment of a governance structure, a Steering Group, gathering representatives of the most important stakeholders (European Union 2012). Additionally, when designing a strategy, policy makers should place themselves into the larger system to which they belong, *i.e.* national and/or European, depending on their territorial level (Foray 2015). This integrated character of the policy calls for coordination and cooperation between different levels, subject to their competencies, with the aim to create synergies, complementarities and to avoid fragmentation of efforts (Gianelle et al. 2016).

At the time Operational Programmes were adopted in 2014, the ex-ante conditionality was considered as partially fulfilled in the Partnership Agreement of 20 Member States (Tolias 2019), including Romania. For the next programming period, the same strategies represent an enabling condition for Policy Objective 1 – *A smarter Europe by promoting innovative and smart economic transformation* – requiring the fulfilment of seven criteria for declaring ERDF expenditure[12]. To meet the criteria, existing strategies need to be redrafted and redesigned.

Since the beginning of the current financial exercise, the Joint Research Centre of the European Commission (EC) has been offering targeted support for smart specialisation in lagging regions[13]. In such regions the success of smart specialisation is crucial for development; however, along with less developed ones these are confronted with several shortcomings that hinder the impact of the policy. Lack of capacity at the level of institutions responsible with the process, especially in terms of experience with bottom-up processes (McCann and Ortega-Argilés 2016), weak innovation systems (Trippl et al. 2019) and tensions between approaches taken at the national and regional levels (McCann and Ortega-Argilés 2016) are some of the general bottlenecks mentioned in the literature as factors hindering proper policy formulation and implementation.

Methodological aspects

From a methodological point of view the research is based on the analysis of available secondary documents, as well as practical experience. In the category of documents analysed, all sources of information documenting the process on regional, and to a certain extent on national level were included, as well as outcomes of the process, *i.e.* legal acts, programming documents,

[11]Annex XI of the Regulation (EU) No 1303/2013 specifies the following fulfillment criteria for a national or regional smart specialization strategy "a) *is based on a SWOT or similar analyses to concentrate resources on a limited set of research and innovation priorities;* b) *outlines measures to stimulate RTD investment;* c) *contains a monitoring mechanism*" accompanied by "*a framework outlining available budgetary resources for research and innovation (…)*".

[12]Annex IV of the Proposal for a Regulation laying down common provisions, COM/2018/375 final - 2018/0196 (COD) sets as an enabling condition *"Good governance of national or regional smart specialisation strategy"* requiring the fulfillment of the following criteria: 1) "*up-to-date analysis of bottlenecks for innovation diffusion, including digitalisation,* 2) *existence of competent regional / national institution or body, responsible for the management of the smart specialisation strategy,* 3) *monitoring and evaluation tools to measure performance towards the objectives of the strategy,* 4) *effective functioning of entrepreneurial discovery process,* 5) *actions necessary to improve national or regional research and innovation systems,* 6) *actions to manage industrial transition,* 7) *measures for international collaboration."*

[13] Further information is to be found on the Smart Specialisation Platform: https://s3platform.jrc.ec.europa.eu/ris3-in-lagging-regions

national guidance materials and publicly available information from the dedicated section on the web-page of responsible institutions and empirical studies. All documents analysed are related to the 2014-2020 programming period. Secondary documents mentioned were collected through desk research.

In line with the main research aim, this study is mainly descriptive, but at the same time has some explanatory and exploratory elements. Firstly, this is due to the fact that the objective is to point out the main milestones of the Romanian regional smart specialisation processes in relation to the use of European Cohesion Policy funds. Secondly, an aim is to identify some specific bottlenecks characterising the smart specialisation process in Romanian less developed regions. Thus generally, aspects of "who", "what", "how" and "when" will be looked into, answering research questions such as: when were the regional strategies elaborated, by whom and in what context; how was the process implemented, how did it evolve over time and under which circumstances? Specifically, emphasis shall be put on the connections between the regional smart specialisation processes and the implementation of the relevant Operational Programmes financed from Cohesion Policy funds. From this perspective the main link is represented by the ex-ante conditionality for Thematic Objective 1 (Foray 2015; Regulation 1303/2013; Tolias 2019). Connected to examples of bottlenecks that less developed or lagging regions face in the process, special attention is given to the general problems already presented in the literature (Tsipouri 2018; Kocziszky and Benedek 2018; Trippl et al. 2019: Pose and Ketterer 2019, McCann and Ortega-Argilés 2016), reported to the main characteristics of a proper policy design (European Union 2012; Foray 2015; Gianelle et al. 2016).

Smart specialisation in Romania: State of Play

General context

Romania, one of the main beneficiaries of the Cohesion Policy budget, is now in its second financial exercise, preparing for the third one. Until now, the country had a centralised approach to programme management, Operational Programmes (OPs) being prepared and implemented centrally by designated line ministries, similarly to accompanying policies or strategic planning documents (Szávics and Benedek, *forthcoming*). The only partial exception was the Regional OP, with a separate budget for each of the eight NUTS II development regions, justified also with the Regional Development Strategies prepared by the Regional Development Agencies (RDAs) (ibid). Out of the NUTSII regions the capital region (Bucharest-Ilfov) is the only one considered developed. The other seven regions (North West, North East, West, Centre, South West Oltenia, South Muntenia, South East) are less developed. Five of the less developed regions (North West, North East, South West Oltenia, South Muntenia, South East) are also low-income lagging regions (European Union 2017).

RDAs, established at the level of these regions based on Law no. 315 from 2004 on regional development, are non-governmental organisations of public utility. Currently their main task is to act as Intermediate Bodies of the Regional OP. Additionally, they also elaborate, implement and monitor regional level strategies and manage their own projects financed from non-reimbursable funds. Though RDAs are not officially recognised as part of the national research and innovation system, they are the only regional level organisations with tasks connected to strategic planning on the regional level (Ranga, 2018). As such, some RDAs elaborated previous generations of Regional Innovation Strategies and, except for Bucharest-Ilfov RDA, are currently redesigning existing smart specialisation strategies. Strategy revision is strongly interconnected with the proposal to decentralise the Regional OP and with the fulfilment of the enabling condition under Policy Objective 1[14].

[14]The intervention logic for Policy Objective 1 proposed by the Ministry of European Funds contains both national and regional level interventions, the latter being proposed to be part of the separate Regional OPs. Further information is to

The national smart specialisation strategy

For the fulfilment of the applicable ex-ante conditionality under TO1, the responsible line ministry[15] started preparations in 2012, according to Memorandum 5551 from 2012. The document started to be elaborated in 2013 by the Executive Unit for Financing Higher Education, Research-Development and Innovation (EUFHERDI). Established based on Government Ordinance no. 62 from 1999, EUFHERDI is an organisation under the coordination of the line ministry and with a role in implementing national research-development and innovation policies. For the purpose of strategy elaboration EUFHERDI partnered with universities, research institutes, the Romanian Academy of Science, as well as two consultancy companies. The strategy was elaborated using foresight methods (Ranga, 2018) and based on consultation with organisations from the whole country, especially from the field of research. No entrepreneurial discovery focus groups have been organised and there was little involvement of the business environment and of RDAs in the process[16]. Encompassing four priority areas, the National RDI Strategy 2014-2020 was approved in 2014 through Government Decree no. 929.

As already mentioned, the document was referred to in the Romanian Partnership Agreement approved by the EC in August 2014, as representing partial fulfilment[17] of the ex-ante conditionality "*A national or regional smart specialisation strategy is in place*", applicable to the Competitiveness and Regional OPs. For fulfilment, Romania started to work on the inclusion of the regional dimension in the national-level document, supported by entrepreneurial discovery processes and through the establishment of a governance system[18]. The first two aspects were included by EUFHERDI in a project that received financing from the Administrative Capacity OP 2014-2020[19]. Implemented between 2016 and 2019, without the formal involvement of the RDAs, the project included the monitoring of regional innovation ecosystems, regional entrepreneurial discovery processes and workshops to integrate regional input to the national strategy. For the moment the National RDI Strategy 2014-2020 was not yet amended based on the outputs of the project. Governance of the strategy was undertaken by the

be found on the webpage of the Ministry: http://mfe.gov.ro/minister/perioade-de-programare/perioada-2021-2027/. The less developed regions will need to redraft their strategies, while Bucharest-Ilfov has to design a smart specialisation strategy.

[15] Based on the Memorandum the National Authority for Scientific Research, an institution subordinated to the Ministry of Education, Research, Youth and Sports (currently the Ministry of Education and Research) was responsible for elaborating the strategic document.

[16] The strategy has been elaborated in the framework of a project containing eight work packages. Their detailed description, as well as information on the consultations and organisations involved in the elaborationcan be found on the dedicated webpage of the project: www.cdi2020.ro.

[17] The Partnership Agreement explains that the strategy has smart specialisation strategic orientations that have been built on the guidance of the European Commission from a methodological perspective, taking into account the content of other strategic documents elaborated on the national level and using modern foresight methods. It adds that the strategy foresees measures to stimulate RDI investments that are based on the needs of enterprises.

[18] Linked to ex-ante conditionalities that are not fulfilled or partially fulfilled the European Commission establishes action plans together with the responsible national institutions. Steps taken towards fulfillment are monitored by Commission services until conditionality is fulfilled. While the action plan itself is not available, one document of the Ministry of European Funds could be found linked to the subject: Memorandum on the fulfillment of ex-ante conditionalities foreseen in the Partnership Agreement and measures necessary for their fulfillment until December 2016, approved on February 24th, 2016.
http://www.fonduri-ue.ro/images/files/legislatie/nationala/Memorandum.aprobat.24.februarie.2016.pdf. Based on the text of the Memorandum, the fulfillment of ex-ante conditionalities linked to TO1 are receiving assistance through a project financed through the Administrative Capacity Operation Programme 2014-2020. The document continues by mentioning that the only action meeting difficulties in implementation refers to operationalisation of the National Committee for Competitiveness mentioned in the National Competitiveness Strategy, a body that should have been also invested with the responsibility to implement smart specialisation on the national and regional level.

[19]The project is entitled "Developing the administrative capacity of the Ministry of Research and Innovation to implement actions set out in the National Strategy for Research, Technological Development and Innovation 2014-2020" and is presented on EUFHERDI's official website: https://uefiscdi.gov.ro/dezvoltarea-capacitatii-administrative-a-mci-de-implementare-a-unor-actiuni-stabilite-in-strategia-nationala-de-cdi-2014-2020.

National Council for Competitiveness established through Government Decision 236 from April 11, 2016 with the aim to monitor the implementation of the National Competitiveness Strategy 2014-2020.

Smart specialisation at the regional level

By the beginning of the current programming period, even if not linked to the programming process, some RDAs started to voluntarily develop smart specialisation strategies: North East region had its strategy adopted in 2014 (Healey, 2016; Ranga, 2018), West region finalised its own strategy in 2013, with the support of the World Bank (Ranga, 2018), while Centre region also had a strategy in place by 2014. In this latter case, the RDA relied on its own staff, while North East involved an external consultancy company. At the end of 2015 North West region also embarked in the smart specialisation process. South Muntenia and South West Oltenia, finalised their strategies in 2016 (Szávics and Benedek, *forthcoming*). These last two policy documents were also elaborated by consultancy companies. Though voluntary, the exercise also had some practical grounding. By the beginning of the programming period it had become obvious that in order to be able to attract sources of financing under Union Initiatives or the Interreg Europe Programme, regional smart specialisation areas had to be officially identified through a Smart Specialisation Strategy put in place. This was not only necessary for the RDAs to develop their own successful projects, but also for them to support different regional stakeholders that wished to apply for funds under these programmes. Forerunner regions generally followed the methodological guide of the EC, but entrepreneurial discovery processes were not fully operationalised and in some cases no governance structures were established.

2016 marked two important milestones linked to the regional level smart specialisation process. Firstly, North West and North East regions were selected to receive assistance from the Joint Research Centre of the EC in a pilot project called "*RIS3 support for lagging regions*", financed from a Preparatory Action of the European Parliament (Ranga, 2018). Based on an initial needs assessment, the project concentrated on the operationalisation of the entrepreneurial discovery process providing assistance in the development of monitoring mechanisms and strengthening governance and capacity building of the RDAs (ibid). The project was finalised in mid-2018. As a result, North East region revised its initial strategy and North West region finalised its policy document (Szávics and Benedek, *forthcoming*). Nevertheless, one other main output of the project was an additional direct allocation of 50 m EUR budgeted for the two regions in order to finance innovation projects generated at the entrepreneurial discovery processes organised with the methodological support of the Joint Research Centre. This was marked through the amendment of the Regional Operational Programme 2014-2020 approved by the Directorate-General for Regional and Urban Policy in March 2018[20].

The second milestone was represented by another modification of the Regional Operational Programme, as of March 2016, concerning Priority Axis 1 of the OP (Promotion of technology transfer), with a budget available only for less developed regions (Szávics and Benedek, *forthcoming*). Based on this amendment RDAs were requested to elaborate regional Concept Notes or Framework Documents for smart specialisation (ibid) in order to support the implementation of two operations under the priority, financing mainly infrastructural investment in technology transfer offices and scientific and technological parks. To underpin this task, relying on the official EC Guide, the Managing Authority of the programme elaborated a methodological framework, putting stress on establishing a governance structure for the process, on the organisation of entrepreneurial discovery focus groups, and on proper identification of priority areas, including their harmonisation with the national smart specialisation priorities

[20]The amendment concerned Priority Axes 1 – *Promotion of technology transfer* - of the Regional OP 2014-2020. Besides the already existing three types of operations to be financed, a third category has been introduced referring to projects generated at the regional level at entrepreneurial discovery processes.

(MRDPA, 2018). As an outcome, all less developed regions elaborated Concept Notes. Relying on the Framework Document, South East and North West finalized their strategy and Centre region updated its existing policy document (Szávics and Benedek, *forthcoming*). In most regions Concept Notes were elaborated by the RDA's own staff, similarly to the strategy update. Only South East region cooperated in this sense with external consultants.

In 2018 the Joint Research Centre started to implement the second stage of the project, rolling it out to all Romanian regions, including Bucharest-Ilfov, the developed capital region (Ranga, 2018). Activities of the project coordinated by DG Regio take into consideration the differences on the level of regions, *i.e.* the higher experience of North West and North East regions, where the project was piloted in its first stage, the existing experience in all other less developed regions, and the need for the initiation of the process in the capital region (ibid.). Presented in detail by Ranga (2018), the main elements of the project include further support in conducting entrepreneurial discovery processes, assistance in strategy monitoring and in strengthening governance, including regional-national coordination, as well as capacity building of RDAs and that of key actors. In both stages of the project, targeted RDAs have been included in horizontal activities implemented by the Joint Research Centre, further supporting European lagging regions in smart specialisation related capacity building (ibid).

Discussion and conclusions

The aim of this paper was to present, as a case study, the evolution of the smart specialisation process in Romania's less developed regions, and to identify main milestones of the process in the context of Cohesion Policy. Additionally, one other objective was to bring empirical evidence linked to specific bottlenecks encountered in the process by such regions.

As has been shown, for the 2014-2020 programming period Romania officially submitted a national strategy, linked to the ex-ante conditionality for Thematic Objective 1, partially fulfilling it. Even though the elaboration of smart specialisation strategies started in some regions at the beginning of the financial exercise - firstly in North East, West and Centre regions, then in South West Oltenia, South Muntenia and North West regions – this was rather a voluntary exercise, without formal connection to the use of Cohesion Policy funds. However, by the midst of the programming period, regional level strategies started to gain importance and became interlinked with the use of funds. This happened in connection to the implementation of one of the two OPs selecting Thematic Objective 1.

The first important milestones of this process are linked to year 2016, when the Joint Research Centre started its pilot project in North East and North West regions and when the Regional OP was amended, triggering the start of the smart specialisation process in all seven less developed regions. 2018 brought the following landmark, when all less developed regions from the country had their strategy in place and the Regional OP was amended again, earmarking a separate allocation for the smart specialisation projects of North West and North East regions. A connection between regional smart specialisation strategies and processes and the use of funds was triggered by the EC, requesting the elaboration of regional strategies after a review of the programming documents and based on the concern that the national strategy excluded the regional territorial dimension (Healey, 2016). This idea is reinforced by Ranga (2018), mentioning that the design of regional smart specialisation strategies was undertaken as a responsibility by the RDAs in order to meet the ex-ante conditionality for ERDF.

One major benefit of the process is that regional smart specialisation strategies became strongly interconnected with the use of ERDF under Cohesion Policy, at least connected to the Regional Operational Programme, even if to a different extent, *i.e.* in the case of North East and North West Regions, not only connected to technology transfer operations but also linked to smart specialisation projects generated at entrepreneurial discovery focus groups. Another benefit is that the necessity to elaborate the regional Concept Notes brought about a methodological harmonisation in the process, as well as a certain level of coordination of the

regional processes that ran separately until then. Additionally, this resulted in a correlation of the regional smart specialisation priority areas with those defined at the national level. While the importance of the regional strategies grew in the context of Cohesion Policy, on the country level steps were taken in the same direction, *i.e.* towards incorporating the regional dimension in the national strategy. Nevertheless, the processes at the two territorial levels run rather in parallel than converged (Ranga, 2018). This can be partly due to the atypical situation itself, meaning that regional strategies became interlinked with the use of funds by the mid-point of the programming period and in a step-by-step process. Additionally, the lack of any formal relationship between the RDAs and the institutions involved at the national level in management of research-development-innovation policies has also contributed to this situation. This lack of coordination and cooperation between territorial levels is one of the characteristics of such processes in less developed regions (McCann and Ortega-Argilés, 2016) and might represent a challenge to be overcome in the preparation for the next programming period.

Linked to the future exercise, it is hard to tell to what extent the enforcement of the regional dimension of smart specialisation in the context of the Cohesion Policy contributed to the decision to decentralise the Regional OP. This needs to be interpreted based on information gathered through further research, including other aspects deriving from the implementation of the Regional OP that can potentially point towards the same direction. Nevertheless, what can be concluded is that the experience gathered by the RDAs during this process will most probably be exploitable during the regional programming process for 2021-2027. However, regions do not embark in this experience from the same level. North West and North East are more experienced due to their selection in the first stage of the pilot project implemented by the Joint Research Centre, all other less developed regions having less experience in this sense (Ranga, 2018). Variance between the levels of experience at the regional level can be identified as one other characteristic of the smart specialisation process in Romania's less developed regions. This is not only connected to the fact that not all regions were involved in the pilot project of the Joint Research Centre from the beginning, but also to the fact that they started the smart specialisation process in different years. North East, West and Centre regions were forerunners in this sense, followed by South West Oltenia and South Muntenia, then by North West, the South East region being the last embarking in this process.

Another indicative that became apparent is connected to the lack of capacities at the regional level. With the exception of Centre and North West regions, all RDAs involved external consultancy in the design of their strategy (West, South West Oltenia, South Muntenia, South East) or its first version (North East). This finding can be completed with the information presented by Ranga (2018), mentioning that the competencies of the RDAs, except for North East region, are limited, with small teams of 3-5 people being involved in the design and implementation of smart specialisation strategies while also having other tasks. Finally, as concerns at least the beginning of the process, lack of experience with bottom-up processes and in establishing regional governance mechanisms for stakeholder involvement (McCann and Ortega-Argilés, 2016) can also be identified. As has been shown, in the regions embarking first in the strategy elaboration process less emphasis has been put on entrepreneurial discovery processes and on setting up governance structures.

However, some of these bottlenecks can be regarded as having been at least partially overcome in the last years by Romanian regions. This is due to the connection of regional smart specialisation processes with the use of Cohesion Policy funds and to the continuation of the Joint Research Centre pilot project. Experience gathered during 2014-2020 can generally be capitalised on by regions during the preparation for the next programming period. However, the ones that finalised or updated their strategies after the elaboration of the Concept Note will certainly be favoured in this process. The actual extent of capacity enforcement at regional level as a result of the smart specialisation experience so far can only be captured through interviews with stakeholders. This can bring valuable qualitative information that is missing from the present case study and could contribute to formulating more articulate conclusions in line with

the research aims. The limitation of the present study can represent a next step in further research along with an analysis of the results of regional smart specialisation processes.

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Romania's National and Local Tourism Strategies in Global and Regional Context: Trends, Competitiveness and Performance

The purpose of this article is to investigate Romania's national and local strategies in tourism field and to compare them with global and regional data. Content analysis and data processing were the methods used. Trends in tourism are identified, with Romania following most of the regional ones and increasing its competitiveness level in the Travel and Tourism Industry (while still needing to improve certain aspects). Strategies in tourism are analyzed and the main markets, forms of tourism and destinations are discussed.
Key words: trends in tourism, competitiveness, strategies, Romania, Cluj-Napoca
JEL code: L83

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Introduction

The Travel and Tourism Industry (T&T industry) continues to build bridges between people, not walls, as evidenced both by the increase in the number of international travelers and the worldwide trends in adopting more permissive visa policies (World Economic Forum, 2017). Nowadays, T&T is growing in importance and is able to provide economic development while facing changes and challenges in keeping up with a series of trends for the following years. In 2018 there were 1.4 billion international tourist arrivals worldwide and it is expected to grow at 1.8 billion by 2030 (World Economic Forum, 2019). This available market, in numerical growth, attracts or should attract the attention of policy-makers and other industry stakeholders and capturing as much of the tourism demand as possible can be realized if T&T competitiveness is developed (World Economic Forum, 2019) and if there advantageous development directions are followed.

At the global level, Europe is still the region that receives the biggest number of international travel arrivals and within this continent the European Union registers the biggest share of them (World Tourism Organization, 2018). Romania has usually followed the tendencies in European's tourism (Ciangă and Pătrașcu, 2010). The opening of this country's tourism to the market economy has gone through three periods: before privatization (1990-1997), the big wave of privatization (1997-2007), and after joining the European Union (Matei et al.,2014). Lately, this country, the Northwest Development Region and Cluj County have registered annual growth regarding international travel arrivals. These are the NUTS 2 and NUTS 3 units where Cluj-Napoca is located, which is one of the principal urban travel destinations of the country. It is a medium-sized old urban center, gaining the rank of city in the 14th century (Benedek, 2006), is considered the hearth of the historical region called Transylvania (Nagy et al., 2018) and is one of the country's main economic poles (Benedek, 2016). Cluj-Napoca's growth in popularity as a travel destination is proved by the fact that in 2016 the number of tourists (recorded by the Romania's National Institute of Statistics) exceeded the number of the inhabitants and, since then, continuous growth has been observed, as shown in Figure 1 (www.insse.ro).

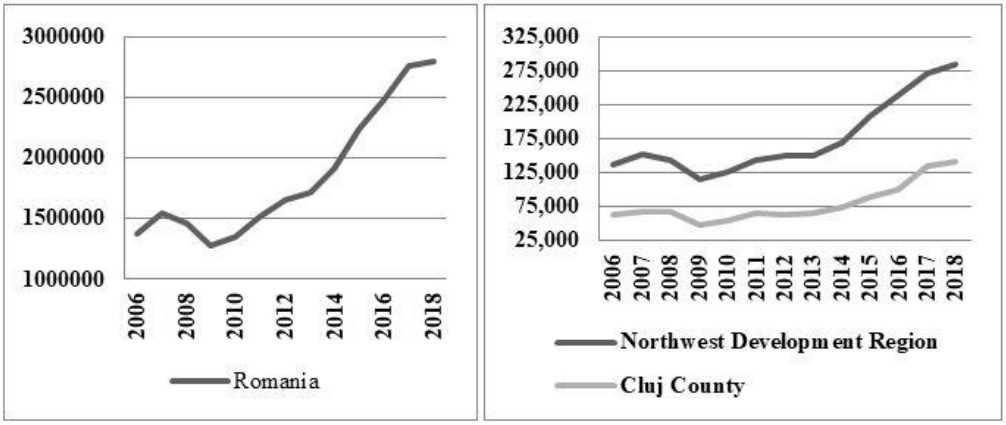

Figure 1: International tourist arrivals in Romania, North-West Development Region and Cluj County
Source: Authors' own work, data from National Institute of Statistics, Romania

In this article the tendencies, competitiveness and performance of Romania's national and local tourism strategies are investigated and compared with global and regional data. It focuses upon tourism in relation to Cluj-Napoca and the wider context in which this occurs. To reach the local level, understanding also the context in which incoming tourism takes place, analysis we carried at various levels such as global, regional and national.

Thus, the global and regional situations regarding international tourism and trends in this field, the extent to which Romania follows the trends and its competitiveness in T&T industry will be considered, the strategic documents and development directions regarding tourism will be analyzed.

In order to create is necessary to be aware of the trends in the field, from worldwide to local level, to follow certain development directions knowing who the tourists are and what their characteristics are. Afterwards, proper travel services and packages can be made and promoted by adequate means.

Thus, this paper has the following questions:

1. What are the trends in tourism and to what extent is Romania following them?
2. What is Romania's level of competitiveness in the T&T field?
3. What are the features of foreign tourist demand in Romania?
4. Which are Romania's directions regarding incoming tourism?
5. How is Romania's tourist offer promoted?

Methodology

Content analysis and data processing were the methods chosen. Information from the Travel and Tourism Competitiveness Index 2019 was examined to present the situation of Romania. Data from Romania's National Statistics Institute, reports, strategic documents and other official papers regarding the topic were consulted. Various indicators related to travel demand were analyzed. Also, there was processed information presented on the website of the World Tourism Market – the biggest business-to-business travel market in the world - that took place in London in November 2019, which was used to analyze the promoted travel destinations, types/forms of tourism and travel packages.

The Travel and Tourism Competitiveness Report 2019 presents the situation of 140 countries, including Romania. The 140 economies represented around 98% of the Travel and

Tourism GDP at world level. In the report, this country was placed in the Balkan and Eastern Europe Region together with Hungary, Moldova, Bulgaria, Slovenia, Poland, Slovak Republic, Montenegro, Albania, North Macedonia, and Bosnia Herzegovina. Data presented in this report are useful for policy makers and other public and private stakeholders in the area (World Economic Forum, 2019).

We consulted documents regarding the actual situation, strategies and trends in T&T field, from the global to local level. Documents including Romania's National Strategy for Tourism Development 2019-2030 (made in 2018 as result of a cooperation between the Ministry of Tourism, General Secretariat of the Government of Romania and World Bank, made in public-private collaboration), the Master Plan for Romania's National Tourism 2007-2026, the Government Programme from October 2019, the Development Plan of Northwest Region 2014-2020, Cluj County Development Strategy 2014-2020 were useful and consulted in order to be aware of the development directions.

Trends and competitiveness in tourism

Worldwide, there are certain trends registered regarding T&T field. They consist of: growth in prioritization of T&T industry sector (government attention, efficient marketing, financial support), growth in international openness, travel becoming safer and cheaper, advancements in sustainable management in T&T field, improvement of infrastructure - especially in air transportation - development of digital services and connectivity and the rise in the number of leisure and business tourists (World Economic Forum, 2019).

According to UNWTO, at the European and European Union level the number of international tourist arrivals is projected to grow. In EU countries, until 2030 it is estimated that the average annual growth will be 1.9 % per year, in the period 2020 - 2030, the growth of this index in the developed countries of the EU is expected to be 1.3% and in emerging economies 2.8% (World Tourism Organization, 2018).

It is important for the actual situation, needs and trends at regional level to be recognized. The countries from the Balkan and Eastern Europe region, where Romania was placed in the T&T Competitiveness Report, have the following features: they need and tend to grow their competitiveness in T&T, they enhance T&T prioritization, their price competitiveness is their most important relative advantage, they have important growth in air infrastructure and need to improve ground infrastructure, they need to improve the enabling environment and to reduce the difference with other regions regarding natural and cultural tourism (World Economic Forum, 2019).

Romania is following the trend of an increasing number of tourists, both domestic and international. In 2019 the number of international tourist arrivals was 2,760,100. In the T&T Competitiveness Index 2019, Romania was in rank 7 in its region for the number of international tourist arrivals. In overall competiveness in T&T in this region, Romania occupied rank 5 after Slovenia, Poland, Bulgaria and Hungary. Countries from this region need to grow their competitiveness in T&T industry and have one of the fastest rates of developing Travel and Tourism Competitiveness. Romania follows this tendency, occupying rank 66 in 2015, place 68 in 2017 and rank 56 in 2019 (www.weforum.org).

Romania is also registering growth in prioritization of the T&T industry, following this general trend (World Economic Forum, 2019). In comparison with the results of the T&T Competitiveness Index from 2017, in 2019 the overall situation of the international openness remained the same, Romania being at rank 45 at world level (www.weforum.org)

One tendency is that travelling is becoming safer and less expensive and, for the economies belonging to Balkan and Eastern Europe, it is mentioned that their most powerful relative advantage consists of price competitiveness. Regarding the price competitiveness overall index, Romania climbed 34 places in the ranking (ranked 85th in 2017, 51st in 2019). The relative cost regarding accessing international flights and retail diesel fuel prices decreased, the hotel price

index grew slightly and the purchasing power parity' evolution remained static. Also, the level of the safety and security index moved upwards, Romania occupying the 29th rank in 2019 (in 2017 - 39th place), improving the situation regarding business costs of crime and violence, trust in police services, a dropping homicide rate and a good point is the lack of terrorism attacks. In the region there is the trend of improvement in the sustainable practices in travel and tourism field in almost all countries. Romania also follows this improvement tendency (www.weforum.org).

There is a tendency for achieving advances in infrastructure, especially in developing air transportation and this region registers a strong improvement in air transportation infrastructure. Romania improved its situation regarding air transport infrastructure (ranked 82nd in 2017, 72nd in 2019) and recorded improvement in quality of this infrastructure, domestic and international disposable seat kilometers, aircraft departures and number of operating airlines. The regional tendency of needing to improve ground infrastructure is valid also for Romania which needs to continue in this direction because the quality of road infrastructure is in the fourth quarter of the ranking and the railroad infrastructure is in the 61st place. Romania improved its tourist service infrastructure (ranked 62nd in 2017 and 54th in 2019) and development was also recorded in hotel rooms/100 population, quality of this type of infrastructure, and number of automated teller machines. Nevertheless, the quality of tourist services infrastructure needs to improve, being in the last quarter of this ranking (119th place in 2019) (www.weforum.org).

There is a worldwide tendency to achieve improvement in digital services and connectivity. For Romania, the ICT Readiness sub-index has registered growth (ranked 60th in 2017 and 55th rank in 2019) and, with the exception of ICT utilization for biz-to-biz transactions - which remained static - and the mobile network coverage that was already at 99.9%, the other items of this sub-index recorded improvement: the measure of using biz-to - consumer transactions, percentage of adults that utilize the internet, subscriptions - to cellular phones and fixed-broadband Internet or quality of electricity provision. The index regarding the enabling environment recorded development in the last period (ranked 58th in 2017 and 51st in 2019). Nevertheless, for the business environment sub-index, a priority in improving would be regarding the time required to deal with construction permits, the time needed to start a business and the effect of taxation on incentives to work. Regarding the health and hygiene sub-index, the evolution is static (ranked 36th). The human resources labor market sub-index recorded improvement, while remaining one of the aspects that requires development as soon as possible (ranked 73rd in 2019), especially in terms of the qualifications of the labor force (primary and secondary education enrollment, staff training, customer orientation), the ease of finding skilled persons to employ, pay and productivity, or the rate of women being professionally active (www.weforum.org). The other sub-indexes of the enabling environment (safety and security and ICT Readliness) have been previously analyzed.

There is a trend for an increasing number of tourists taking part in leisure and business tourism. According to Romania's National Statistics Institute, in 2018 a bit more than half of foreign tourists have travelled for professional reasons (business and MICE - Metings, Incentives, Conferences and Exhibitions) - 56.7% - and the rest for particular reasons, of which almost three-quarters were travelling for vacation, this percentage being constant in all 4 – four quarters of the year (Romania's National Statistics Institute press releases 156/2018, 241/2018, 327/2018, 65/2019). The same thing is highlighted by the president of the Incoming Romania Association, Ovidiu Tudor, who mentions that the incoming forms of tourism important in the present are: business, event tourism and leisure (www.wall-street.ro).

Regarding reducing the difference with other regions in natural and cultural tourism, Romania's natural resources overall index improved its situation (ranked 68th in 2017, 56th in 2019) and the cultural resources index remained the same for the number of World Heritage cultural sites and digital requests for both cultural and entertainment forms of tourism, while it grew for the intangible cultural heritage (www.weforum.org).

According to Romania's National Strategy for Tourism Development 2019-2030, at the moment there are three principal challenges for Romanian tourism: improving the infrastructure used by tourists and the services offered to them, better coordination between public and private tourism stakeholders and better marketing and promotion of travel destinations and experiences (Strategia Nationala a Romaniei pentru Dezvoltarea Turismului 2019-2030)

Tourism international demand, priority directions and promotion of the destination

Regarding the geographic features of the travel demand, according to Romania's National Statistics Institute, the situation of residence country of the foreign visitors registered at Romania's border is presented in Figure 2, where it can be noticed that the neighboring countries predominate. This is especially the situation of tourists that choose to arrive in Romania by ground transportation: in 2018 73.7% arrived by road (Activitatea de turism in anul 2018, nr.4/2018). There is a worldwide trend that the biggest part of international travel is realized within the region where the tourist resides (World Tourism Organization, 2018).

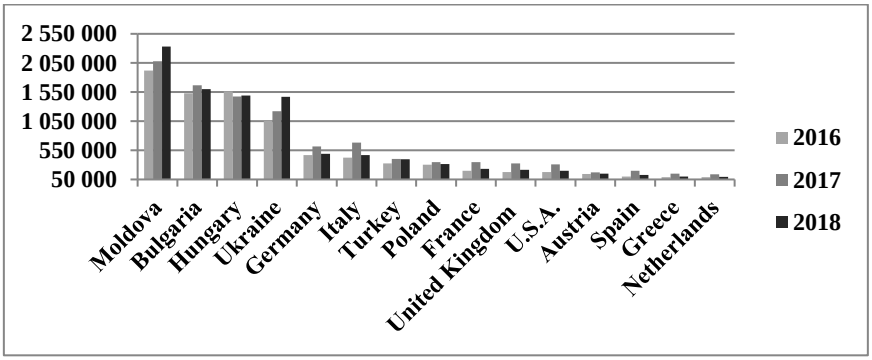

Figure 2: The residence country of the foreign visitors registered at Romania's border
Source: Author's own work, data from Romania's National Statistics Institute (2016, 2017, 2018)

Foreign travelers who consume travel packages from Romanian travel agencies present a somewhat different picture: the top issuing countries (with at least 2,000 tourists in 2018) are presented in Figure 3.

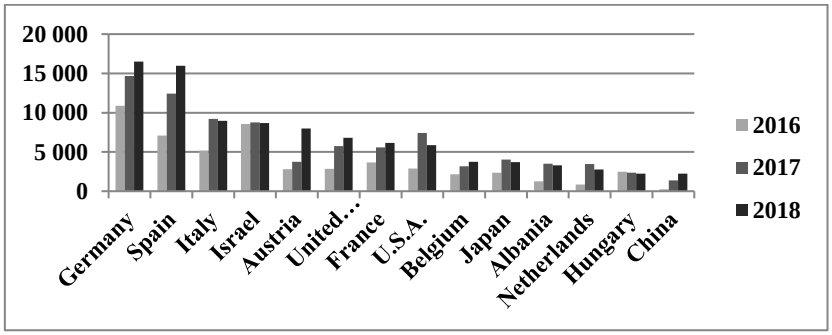

Figure 3: The nationality of foreign tourists participating tourist actions in Romania organized by incoming travel agencies from this country
Source: Authors' own work, data from Țacu and Apreutesei (2017); Țacu et al. (2018), Țacu et al. (2019)

The principal markets for travel agencies from Romania are: Germany, Spain, Israel, Italy, Austria, United Kingdom, France, USA, Belgium, Japan, Albania, the Netherlands, Hungary and China. Rapid growth can be seen in the situation of Spain. Evidence that this country is an important market for incoming tourists in Romania could be represented by the events organized by the former Ministry of Tourism and Romania's Embassy in Spain in May 2017. The reasons for the events were to promote Romania as a travel destination, raise its visibility, encourage incoming tourism in Romania and establish easier direct contact between tour operators by a meeting with Romanian and Spanish travel agencies (www.turism.gov.ro).

In 2018 the number of tourists that purchased services from Romanian travel agencies was 111,056 persons. From the total of foreign tourists who consume the travel packages from Romanian travel agencies, the vast majority used the services of Romanian tour operators (96.6% in 2016, 94.3% in 2017 and 94.7% in 2018) rather than retail/intermediary agencies(Tacu and Apreutesei, 2017; Tacu et al. 2018; Tacu et al. 2019).

In collaboration with the World Tourism Organization, a Master Plan was created for Romania's National Tourism in the 2007-2026 period. This document was intended to be a general framework of policies adopted in order to develop tourism and to implement sustainable management of this economic sector. In this Master Plan, areas of potential development of tourism were identified (Master Planul pentru Dezvoltarea Turismului National 2007-2026). These areas are presented in Table 1.

Table 1

The areas of potential development of tourism according to Romania's Master Plan for Developing National Tourism 2007-2026

Destination / Activities	City-Break In Bucharest	Tourist circuit in Transylvania	Maramureș	Bucovina	The Black Sea Coast	Danube Delta
MICE	X					
Culture	X	X	X	X	X	
Entertainment	X				X	X
Ecotourism		X	X	X		X
Nature		X	X	X		X
Adventure tourism		X	X	X		
Skiing		X	X	X		
Beach					X	
Cruises					X	X
Health and treatment		X		X	X	

Source: Author's own work, Data from Master Planul pentru Dezvoltarea Turismului National 2007-2026

In Romania's National Strategy for Tourism Development, the main forms of tourism that can be practiced in this country were grouped as follows: nature and adventure, winter sports and skiing, culture and history, health and wellness, sea & sun, city-breaks, MICE, and gastronomy. After analyzing Romania's T&T Competitiveness Index 2017 making comparisons between Romania and other competing countries, and taking into consideration the tendencies in tourism, it was concluded that this country should focus on four segments: adventure and nature (with a focus on rural tourism and ecotourism); cultural heritage, culture and history (with gastronomic experiences); MICE; and health and wellness. Also, they are followed by three

other forms of tourism that should be prioritized in the future – city-breaks, winter sports, and sand and sea tourism (Strategia Nationala a Romaniei pentru Dezvoltarea Turismului 2019-2030).

For comparison, a content analysis was carried out of data presented on the site of World Travel Market regarding the travel offers for Romania of travel agencies promoted at this travel fair (www.london.wtm.com). The forms of tourism presented were: business, luxury, spa and wellness, leisure, FIT - free independent travelers, off-road, cultural, ecotourism, active, adventure, cycling, hiking, trekking, and skiing, most of which are presented in the Master Plan. Also, the types of packages regarding group preferences were: private with or without guide, group travels, for small groups, and family trips; and about duration was: half-day, one-day cruises, tours in Romania lasting several days, and multi-country tours lasting several days. There were promoted thematic tours: wine, gastronomy, with workshops, for Halloween, and music (the George Enescu Festival).

Also the promoted travel destinations continued to be the ones promoted in the Master Plan: Transylvania, Bucovina, Bucharest, the Black Sea Coast, the Danube Delta, while the Carpathians and also the Banat region were highlighted.

In Transylvania tours were offered related to citadels, churches, medieval cities, villages, hills, Multicultural Transylvania, bicycle tours, off-road tours, 2-8 day tours, Bucharest-Transylvania-Bucharest tours, and Christmas Markets, including also Cluj-Napoca. For the Carpathians travel packages were promoted providing nature, adventure, culture, and ecotourism forms of tourism, off-road, hiking, 4-8 day circuits seeing natural areas, castles and villages. Bucovina was promoted as a cultural destination, highlighting the painted monasteries, and Bucharest continues to be promoted as a city-break destination (4 days) or a starting and finishing destination for multi-days tours: Bucharest-Black Sea-Bucharest or Bucharest-Transylvania-Bucharest.

Restricting the area, we decided to further analyze the Northwest Region. According to the region's actual development plan, for the 2014-2020 period the challenges were regarding the fields of sustainable development of spa, cultural and mountain tourism and in promoting North Transylvania as a travel destination on international markets, building on the already existing international reputation of the Transylvania brand (Planul de Dezvoltare al Regiunii Nord-Vest 2014-2020). Reaching the level of Cluj County, the Cluj County Development Strategy 2014-2020 was consulted. The main strategical directions for the county are: becoming a modern and competitive economic center, a scientific and educational pole, a medical center, a touristic and cultural pole, the center of Transylvania, easily accessible, possesing a modern infrastructure, a place with best quality public services, a green county. Also, another direction is Cluj-Napoca – European metropolis (Strategia de Dezvoltare a Judetului Cluj 2014-2020).

The direction regarding tourism is that Cluj County's tourism should be integrated into the touristic system at various levels (regional, national, international), the offers should be suitable for the many and various categories of potential tourists and able to encourage growth in visitor' numbers. Also, the goals are: increasing the area's attractiveness, the quality of infrastructure, and quantity of its components (improving the quality of accommodation units, increasing the number of restaurants with local specialities, developing the cultural, leisure and ski facilities), expanding the length of tourists' stays, organizing cultural events, a county-level functional system of both touristic information and coordination, and defining and promoting the county's brand. Last but not least, the priority forms of tourism are: ecotourism, skiing, hiking, mountain, cycling, and caving-tourism; niche tourism (active, extreme, gastronomical, wine, photography/video); wellness; and cultural (related with art, multiculturalism, religion, and folklore) (Strategia de Dezvoltare a Judetului Cluj 2014-2020),

Also, now in process is the elaboration of Cluj County's territorial planning plan (PATJ), which is both necessary and welcome because the existing one was created in 1998, with no update available. This new plan will be able to express the actual situation, priorities and development directions. The county is the first one from Romania which will receive technical

assistance from the World Bank for its elaboration (www.cjcluj.ro). The Cluj county territorial strategy will be elaborated and act as source of inspiration, giving directions for creating the strategies of smaller territorial units such as cities (Referatul de Aprobare al Consiliului Judetean Cluj, nr. 12378/2019).

Regarding Romania's promotion as a travel destination, one weak point is that the country's tourism promoting campaigns change periodically. Since 1996 Romania had the following tourism promoting campaigns: "Eternal and Fascinating Romania", "Come as a Tourist, Leave as a Friend", "Made in Romania", "Romania Simply Surprising", "Romania – Fabulospirt", "Romania - Land of Choice" and "Explore the Carpathian Garden" (Popescu and Corboș). The "Explore the Carpathian Garden" brand cannot be changed until 2020 (www.profit.ro), but it has caused discontent which leads us to believe that it will be changed. Also, there is no touristic brand for the Northwest Development Region (North Transylvania) or for Cluj County.

After many changes regarding Romania's brand, the president of Incoming Romania Association, Ovidiu Tudor, mentions that a further necessary step would be the realization of a national-level program for developing incoming tourism in Romania, called Destination Romania. (www.wall-street.ro).

In 2006, when Romania's Master Plan for tourism was prepared, Romania had 15 tourist promotion offices, located in Hungary, Moldova, Germany, Spain, Italy, Israel, Austria, the United Kingdom, France, the USA, Belgium, Japan, China, Sweden, and Russia (Master Planul pentru Dezvoltarea Turismului National 2007-2026). These were closed and recently the opening of new offices for better contact with the target foreign markets was taken into consideration; the idea of the creation and development of destination management organizations has been proposed, a public-private collaboration which would also promote tourist destinations.

The Destination Management Organizations (DMOs) are important for both the public and private sector. The government mentioned that establishing these organizations is one of the priorities regarding tourism (Programul de Guvernare 2019). Also, the Incoming Romania Association mentions that it is important to created and start operating the DMOs (Asociatia Incoming Romania – press release 27.12.2019).

Conclusion

Thus, in this paper the proposed objectives were fulfilled. Trends in international tourism were discussed and there was discussion on the extent to which Romania is following them and this county's level of competitiveness in the T&T industry. Further, the features of foreign tourist demand in Romania were identified, along with the country's directions regarding tourism and the situation about promoting the tourism offer.

Related with the trends, in general Romania is following most of the tendencies and recorded record growth in competitiveness in the T&T field in recent years, with improvement in various categories. Nevertheless, more improvement is needed, especially in aspects such as better coordination of the public and private sector, improving the infrastructure (mainly ground transportation and touristic infrastructure), the business environment (eg. the level of qualifications of persons working in tourism), and promoting Romania as a travel destination.

The main travel markets are the neighboring countries (especially Hungary, Moldova and Bulgaria), other countries in Europe, either in the European Union (Germany, Spain, Italy, Austria, France, Belgium, Netherlands, Poland, Greece) or not (the United Kingdom, Albania) as well as countries from outside Europe – the USA, Israel, Turkey, Japan and China. Also, regarding markets for travel agencies, very high grow in demand for Romania was noted by Germany, Spain, Italy, Austria, the UK, and the USA, moderate growth by France, Belgium, the Netherlands, Albania, Japan, and China and the interest remained constant for Hungary and Israel.

Most tourists travel either for professional purposes (business and MICE) or for leisure. Since the moment when Romania's Tourism Master Plan was created, the priority forms of tourism has been in the following categories: nature and adventure (especially ecotourism, nature and adventure), cultural (highlighting multiculturalism, history, traditions, gastronomy), health and wellness (especially wellness and spas), MICE, city-breaks, winter sports (skiing), and the sea (cruises, beach).

The main travel destinations have been: Bucharest (for city-breaks and as a starting and finishing point for circuits in Transylvania that sometimes include also Maramures and Bucovina), Transylvania, Maramures, Bucovina, the Black Sea, the Danube Delta and the Carpathians. The priority forms of tourism and travel packages at national level are also partially present in the priority directions of developing tourism also at the level of the Northwest Development Region of Romania and at the level of Cluj County. Regarding promotion, the public and private sectors need to make efforts in this area and collaborate, and Destination Management Organizations are proposed in order to improve and promote Romania's image as a travel destination.

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Nagy, Oana – Păcurar, Bogdan

The Five-Minute-Walk Distance Concept, Case Study: City of Cluj-Napoca, Romania

This concept, also known as "pedestrian shed", refers to the distance that would make the difference for a person to choose between walking or driving to a destination. The distance is visualized as a 400-meter radius area that is most frequently located in the downtown areas/key areas of some large cities or capitals. To better underline this concept's characteristics we have applied it on a case study of the city of Cluj-Napoca, testing the conformance of several areas against the concept's principles. This will show the percentage of studied areas complying with the concept requirements and the conclusions will indicate the proposed set of measures to be applied by the local authorities in order to improve the area concept validation score and, with this, to improve the citizens quality of life. This concept could be easily replicated in any city or capital and its metrics could be used to assess citizens' needs and strongly indicate the measures that are required in order to stimulate walking instead of driving, as a direct result of providing all modern required facilities within a 5-minute walking area.
Keywords: neighborhood, 5-minute walking distance, urban development, city driving, pedestrian shed.
JEL code: O18

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Introduction

For an extended period of time, Romania alongside other communist countries, experienced slow development of its cities and its economy. After the fall of the socialist regimes, these states and their cities went through a much different, more rapid development, influenced by neighboring countries and especially by the West, as these influences enabled easy access and principles, ideas and opportunities for exchange which would have been impossible before that time.

This paper aims to provide an overview of the development of large cities according to a concept devised in the 1920s, aimed to develop and attract investments in multiple key points in a city as well as to supplement the role of the city center, thus making other areas of the city more welcoming and attractive for businesses, construction, governance and day-to-day living.

Walkability is becoming a keyword in planning today, as new urbanism ideas are spreading throughout the profession. Many communities today are suffering from a growing dependence on automobiles and road traffic is the main mode of transportation, which results in low-density development and sprawling development patterns. According to Abley (2005, page 3), walkability can be defined as "the extent to which the built environment is friendly to the presence of people living, shopping, visiting, enjoying or spending time in an area". Walkability is also dependent on the human behavior of the residents in the neighborhood area.

Research methodology

This paper is based on a concept developed by planner and sociologist Arthur Clarence Perry in 1920 in New York. (https://www.conservapedia.com/index.php?title=Clarence_Perry).
He was the first researcher to observe the correlation between distances, heavy traffic and the multitude of people/pedestrians walking more than 5-10 minutes. Perry was influenced by the rising automobile industry in the United States and identified the car as "a new factor in the development of residential neighborhoods". The goal of Perry's research was to investigate the

scale, spatial arrangement and land use of residential communities and, ultimately, to provide a planning framework for new neighborhoods. Thusly, he could appreciate and think of a concept that proved to be revolutionary – The Neighborhood Unit.

What is this concept? How does it work?

The unit of measurement is commonplace in the planning profession and is often represented by a radius measuring one quarter of a mile (400 meters). The average walking speed of a human is at approximately 3 miles km/h, which translates to ¼ of a mile in five minutes. (https://morphocode.com/the-5-minute-walk/). Most planners represent the walking distance on a proposed plan drawing or an aerial as a circle drawn with the center of the circle on the destination. Nowadays, the concept is called "pedestrian shed". (https://urbanlands.co/2010/08/23/the-five-minute-walk-more-than-just-a-circle/).
The pedestrian shed is usually placed around a community center or a common destination such as a school or a public plaza, where social and commercial activity is focused. In urban planning, the "5-minute-walk distance" sets a scope for collecting both quantitative and qualitative data on a human scale.

Perry placed the elementary school in the center of the neighborhood and used it to determine the size and structure of the residential community: the school had to be within reach for all residents and set the quarter-of-a-mile walking distance threshold in the unit scheme (Figure 1). Together with local retail shops, public spaces and residential units, the elementary school was one of the four main functions in the neighborhood unit which means around 65 ha in size that provides housing area for a population of 5,000 to 10,000 people. (Sharifi, A. 2013, page 52)

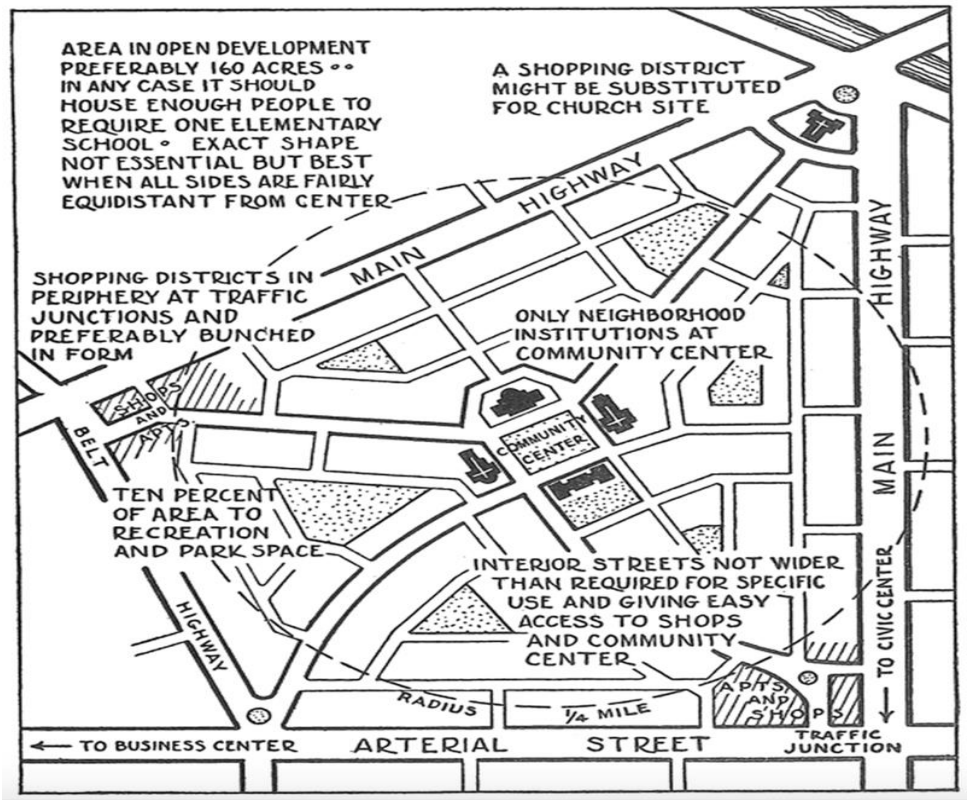

Figure 1: Perry's diagram
Source: https://morphocode.com/the-5-minute-walk/

The general assumption that most people are willing to walk for about five minutes before opting to drive has been subject to debate in urban planning. A large part of the research on walking behavior focuses on commuting and access to transit. The duration of walking trips also depends on their purpose. Trips for shopping and reaching transportation are shorter, while recreational walks tend to be longer. Walking behavior depends on a number of location-specific factors such as proximity to destinations and perceived safety. It also varies across age groups and socio-economic status. Both the 5 and 10-minute walk thresholds are applied in planning. (Yong, Y. And Diez-Roux A.V.,2012, page 2)
In regards to this concept, a number of important articles have been written over time without having a materialized impact within a city, being rather parallel studies on a possible variant of regulating and organizing cities like Chicago, Vancouver or Atlanta. From these works, we can point to Chi-Chang Wang's study in a district of Vancouver (Wang, 1965), Banargee and Baer (1984)'s study focusing on residential environments and public policy, and the neighbourhood concept developed by architect Plater-Zyberk (1991) for Atlanta, Georgia.

The general conclusion drawn on the concept developed by Perry is that the concept can be applied in different ways, depending on the vision of the planner and the key point to be reached – the social or the physical one.

Case study – City of Cluj Napoca, Romania

Most researchers agree that the quarter-of-a-mile (400m) radius describing the walkable circle area is a reasonable distance for determining access to public services and as a result for measuring how walkable a community is.

We applied the concept of "5 minutes walk distance" in the City of Cluj-Napoca, focusing on three study areas:

- Bulgaria neighborhood
- Gheorgheni neighborhood
- Downtown (city center)

From the necessity to have a well defined study which can display the concept in a more flexible way and which makes the concept easy to understand, I chose a list of three specific neighborhoods, the main points being represented by the facilities and services that are available in that territory. The location of the neighborhoods represents three different categories: the downtown is the central area of the city ,where the most numerous and diversified types of services and facilities are located, the Gheorgheni neighborhood, which displays medium characteristics, and the Bulgaria neighborhood, which is the last positioned in terms of services and endowments. With this perfect discrepancy between all three neighborhoods, we considered that the comparison between them will better define the concept developed by Perry.

For calculating the distances from the selected key point (where most of the services and facilities in that neighborhood were concentrated) and destination (the final service/place), we used the Google Earth service and its function of calculating pedestrian distances. Also, to confirm the data provided by Google Earth, we have used the platform www.traveltimeplatform.com, which, like the service provided by Google, allows the calculation of the pedestrian distances from a selected point on a map to a selected destination in a predefined field.

In the study, I considered a series of 14 elements as absolutely necessary to be present in the immediate vicinity of a residential area in order to be chosen as a "typical area" that is, to fit in the concept of the "5-minute-walk distance". I chose as a landmark the central point of the area, where most of the services needed for the population are located. These 14 elements were chosen according to the daily or weekly needs of a citizen: medical services, financial services (banks, insurance, etc), public transportation station, university, schools, kindergarten,

commercial services (shopping & retail), park, entertainment services (theatre, cinema), car parking (including underground parking), spare time and meeting points/socializing (restaurants, bar, pedestrian area, coffee shops), beauty services (barber shop, nail salon, hair salon), accommodation services (hotel/guest house), and religious activity (churches).

All of the compared areas are equivalent for the neighborhood they represent. This case study aims to gather on how the neighborhood concept used in urban areas affects the walkability within the neighborhood areas.

a) Bulgaria Neighborhood

Figure 2:A street in the Bulgaria neighborhood
Source: Own photo

At the origin of the name was a small community of Bulgarian farmers, who arrived in Cluj-Napoca in the ninth century. Although this community numbered only a few dozen families, the name of the area in which they settled has survived even today. Local historians report that the Bulgarians settled in the eastern part of Cluj-Napoca, fled from the Ottomans and were also good gardeners. Over time, the authenticity of the Bulgarian ethnic group in the area disappeared and formed a neighborhood with predominantly industrial specifics, but which underwent residential changes, housing today about 28,000 inhabitants. Most of the services found in this neighborhood are mostly concentrated in the same place. Although the neighborhood does not easily find several common services such as kindergartens, shops, financial institutions, the area is constantly developing and expanding, with the daily approval of residential and commercial projects and buildings.

Table 1:
Results of the case study on the Bulgaria neighborhood

	Distance (in minutes)	Distance on foot (in km or m)
Medical services	6 min	500 m
Financial services, banks	15 min	1.2 km
Public transport station	2 min	120 m
University	19 min	1.5 km
Schools	6 min	450 m
Kindergarten	9 min	750 m
Shopping center	15 min	1.3 km
Park	6 min	500 m
Entertainment (cinema, theatre, opera)	20 m	1.7 km
Car parking	- *	- *
Free time/ Socializing (restaurant, bar, coffee shop)	5 min	400 m
Beauty services (barber shop, hair salon, nails salon)	1 min	90 m
Accommodation services Hotel/Guest house	4 min	350 m
Church	9 min	750 m

Source: Own compilation

*****in the area there is no paid parking and monitored by the local administration; cars can be parked in any available space along the street

In the table, results shown in red are beyond the 5-minute distance. The results show that most of the elements in the Bulgaria neighborhood are located at a distance of more than 5 minutes on foot. The inhabitants of this neighborhood have to use a car or public transport instead of walking in order to perform their daily tasks like taking the kids to school or to the playground, shopping, paying bills, using medical services, etc.

b) Gheorgheni Neighborhood

Figure 3: Gheorgheni neighborhood
Source: Own photo

Gheorgheni neighborhood is the greenest neighborhood and the one that has undergone the smallest changes. The name of the neighborhood comes from the village of Gheorgheni, which is very easy to reach. The neighborhood also includes Gheorgheni Lake, which is almost 600 years old and is also called "Bottomless Lake". The first document dating the existence of the lake is from 1370, and belonged to the king of Hungary, Louis of Anjou. Later, the lake was transformed into a fishery but over time, the lake became one of the most beautiful places of leisure in the city and the most beautiful in the neighborhood. Today, the Gheorgheni neighborhood is a very beautiful, green, airy, and highly sought-after residential area for home purchase, housing the largest shopping center in Cluj-Napoca, near the lake.
Here, the inhabitants can enjoy numerous services, being located relatively at short distances, such as public transport stations, university headquarters, cinemas, parks, etc. Currently, about 45,000 people live in this neighborhood.

Table 2:
Results of the case study on the Gheorgheni neighborhood

	Distance (in minutes)	Distance on foot (in km or m)
Medical services	1 min	96 m
Financial services, banks	3 min	220 m
Public transport station	2 min	180 m
University	10 min	850 m
Schools	4 min	350 m
Kindergarten	5 min	350 m
Shopping center	3 min	220 m
Park	2 min	200 m
Entertainment (cinema, theatre, opera)	12 min	1.0 km
Car parking	11 min	850 m
Free time/ Socializing (restaurant, bar, coffee Shop)	6 min	500 m
Beauty services (barber shop, hair salon, nails salon)	3 min	210 m
Accommodation services Hotel/Guest house	7 min	550 m
Church	1 min	69 m

Source: Own compilation

In contrast to the Bulgaria neighborhood, the residents who live in the Gheorgheni neighborhood had to choose the car instead of walking only for a few services. For activities like taking children to school, shopping, paying bills, and so on, they can walk, as all of these services are at a maximum walking distance of 5 minutes.

c) Downtown – City Center

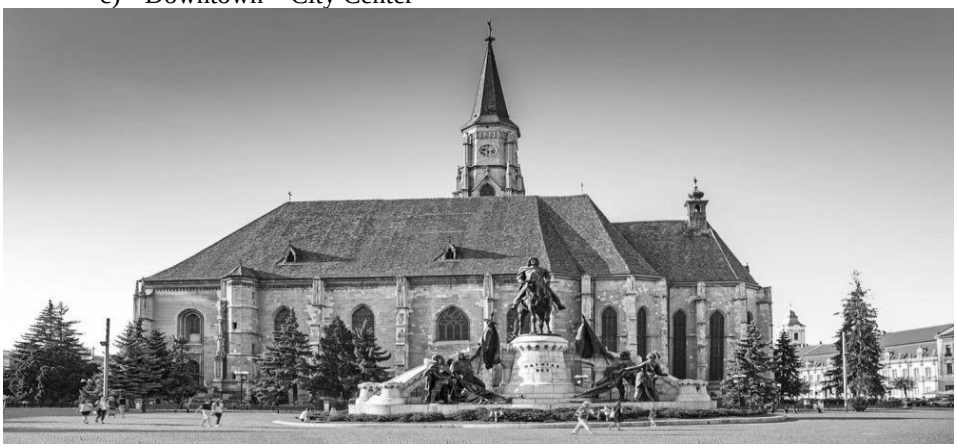

Figure 4: City Centre
Source: Own photo

The main central area is the cultural, financial, administrative and commercial area of Cluj-Napoca. It is structured in 4 large squares that form a triangle: Unirii Square, Mihai Viteazul Square and Avram Iancu Square (where the Romanian Opera and the Orthodox Cathedral are located). The center is individualized compared to the rest of the city after a series of monumental and historical architectural buildings, dating from the XVII-XX centuries. The zero point in the city of Cluj-Napoca is Unirii Square, which is the "medieval nucleus of the city", grouped around the Catholic Cathedral of St. Michael and the Statue of Matei Corvin. The walls of the medieval fortress delimit the former historical fortress of the city that once had only 45 ha. Unirii Square is the largest market (220 m x 160 m) in the countries of Eastern and South-Eastern Europe. In the first part of the 20th century, the square was named Regele Matei Square, after Matei Corvin. After 1980, the square was called Unirii Square, a name that is still preserved today. Colloquial is also called the Great Square or simply the Center. Unirii Square also houses other famous buildings such as: on the side is the Bánffy Palace, which now houses the Art Museum and the two buildings built in the mirror, from which Iuliu Maniu Street begins. On the southern side are the former City Hall and the National Bank. In the southwest corner, you can see the Continental Hotel Building, built in 1894. In addition to the historical, architectural, cultural, administrative, financial and commercial role that it successfully fulfills, the central area also plays a residential role, in a smaller measure. Most of the buildings in which this residential function is found are in the buildings with the minimum height of the ground floor and one floor/attic, where on the ground floor there is an ongoing commercial activity/services and upstairs are in most cases, the home of the business owner. It is very convenient for a buyer to opt for a home in the central area, even small, because absolutely any kind of services, institutions, promenades, shopping, hospitals are in the central area, so it is no longer necessary to travel in other places of the city, except the airport which is located at the exit of the city. Currently, about 38,000 people live in the central area.

Table 3:
Results of the case study on City Center

	Distance (in minutes)	Distance on foot (in km or m)
Medical services	2 min	190 m
Financial services, banks	1 min	34 m
Public transport station	2 min	150 m
University	4 min	270 m
Schools	5 min	400 m
Kindergarten	7 min	550 m
Shopping center	5 min	350 m
Park	4 min	350 m
Entertainment (cinema, theatre, opera)	8 min	650 m
Car parking	1 min	84 m
Free time/ Socializing (restaurant, bar, coffee shop)	1 min	64 m
Beauty services (barber shop, hair salon, nails salon)	3 min	220 m
Accommodation services Hotel/Guest house	3 min	210 m
Church	1 min	40 m

Source: Own compilation

In contrast with the other two neighborhoods, the Downtown area provides a full range of services and the longest distance that a citizen has to walk is about 650 m, which means 8 minutes.
In the Downtown area, the citizen may find all required services and facilities.
In the central area there are enough parking spaces, whether they are concentrated in the form of a parking lot (multi-level) or they are along the streets, they are used for a fee. Residents of the entire city can benefit from a place or a maximum of two parking spaces in the vicinity of the house, in the form of a monthly subscription that is paid to the local administration. Also, depending on the area where the person lives or where the parking place is located, there are different fees about the proximity to the central area - the closer the parking place is to the central area, the higher the fee. Fortunately, no building project is approved by the local administration that does not benefit from an underground car park containing at least one parking space per apartment and including parking spaces for visitors. As a result, the parking spaces in the central area are used predominantly by visitors/people working in that area for a certain period.

Conclusions

After analyzing the three areas – the Bulgaria neighborhood, Gheorgheni neighborhood and Downtown – we can draw the following conclusions:

- In the central area, the services are numerous, diversified and people can easily move by public transport from any point in the city to the services/facilities objectives located in the city center. They can complete their tasks efficiently, as these services are at maximum 5 minutes away from each other, then they are able to return home using again the public transport. They can also use their own car that may be left in a parking space in the central area and then use it again to return home. This is only required if they do not live in the central area; residents of downtown can access goods and services on foot.

- in the Gheorgheni neighborhood, the services are also numerous, though less diversified than in the central area. Basic services exist and the citizens can solve most of their daily or weekly tasks without having to use their car due to the services being located at maximum 5 minutes away from their homes.
- in terms of services, the Bulgaria neighborhood ranks the worst, lacking services and facilities, which forces residents to walk distances of more than one kilometer or even drive their car or use public transport in order to solve their daily tasks

This study can conclude that urban neighborhood design in City of Cluj-Napoca is still lacking in encouraging people to walk. In addition, certain community facilities that are provided in urban neighborhood areas are not provided at strategic locations. The sustainable principle can be adapted in designing a neighborhood to improve the walkability of people in the urban neighborhood area.

A further conclusion is that the Perry walking distance standard (400 m) is very suitable to be used in a city like Cluj-Napoca.

Solution

The local administration should offer fiscal incentives to investors who want to develop a business, a kindergarten, or a shopping center in those areas where they are missing and are absolutely necessary.

By adopting the "5-minute-walk distance" concept the local public administration and the architects and urban planners who are in charge of horizontal city planning could elaborate future urbanization plans that will allow citizens to walk to required services/facilities, to drive their cars less, and if they need to walk more than 5 to 10 minutes, to choose public transportation; these steps will benefit themselves and the entire city.

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Regional Effects of Research and Technology Institutions – Valuation Methods along the Innovation Process: Monitoring Project Cooperation

Regional impact analyses of scientific institutions show decision makers the importance of infrastructure. The analyses follow different approaches and models, are mostly limited to previously defined effect areas and mainly investigate the effects of universities. This article shows the different evaluation methods of scientific institutions along the entire innovation process. The aim is to provide a holistic overview of methods for identifying evaluation gaps. The first section explains the difference between the linear and dynamic innovation process. Then, the method analysis along the innovation process follows. This is preceded by a critical evaluation of the methods and the definition of the focus for further work. Scenarios on regionality, frequency and dynamics describe my own analysis approach and finally result in a monitoring system of regional project cooperation.
Keywords: innovation process, method analysis, transformation phase, monitoring system
JEL code: R48

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Introduction

Science and research generate innovations and influence the performance of countries and communities of states. The conditions vary greatly from region to region and competition for innovation is fierce. It is therefore important to examine the effects of science and research and to highlight their uniqueness for the innovation process. The innovation process starts with the input of money and personnel and goes through resource transformation to generate knowledge, networks, new products and services, and to educate highly qualified workers. Various evaluation methods reflect the different process steps and effect categories. The evaluation and measurement of the effects as well as a holistic evaluation approach are the subject of this analysis.

Innovation process

For a long time the basic understanding prevailed that the innovation process was a simple linear process with the widespread "science-to-market" idea (see Figure 1).In the linear innovation process, a direct path leads from basic research to applied research (downstream), through innovation to the broad commercial use of technologies and products on a specific market (upstream). During this time, there was a discussion about the triggering side of innovations. Some saw the demand side as a trigger for innovation (demand-pull), some attributed it to the supply side (technology-push) (Dunkel 2006). This linear understanding of the innovation process is shown in Figure 1.

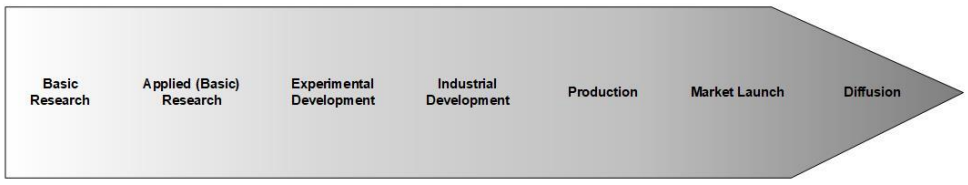

Figure 1: Linear understanding of an innovation process
Source: Dunkel 2006, p. 26

The use of the linear model of the innovation process is useful for analytical descriptions but does not correspond to the real process. Massey notes, "as we reviewed the various theories and models, we began to realise that in almost every major innovation of recent times each functional phase is linked in some way to the others; every phase in our block diagram has lines connecting it to and from every block in the diagram" (Massey et al. 1992, p.79). The turning point of the linear understanding was the Sundqvist Report in 1988: "The interdependence of technical change, economic and social change is in its development and application fundamentally a social process, not an event, and should be viewed, not in static but in dynamic terms" (OECD 1988, p. 11). The real innovation process is complex, cannot be assigned to an extreme value ("demand-pull" or "technology-push"), and consists of feedback, knowledge transfer and relationships between the process actors. Innovations arise at all phases of the process. In contrast to the linear innovation process, the actors interact always and at all times in order to manage the ever-changing conditions (knowledge base, demand for technologies, etc.). The interactive model of the process is understandable as a system of interactions, a system of many movements between individual functions and actors whose experience, knowledge and knowledge reinforce and complement each other. Within the system, two types of interactions occur. The first interaction is within a company or enterprise network, the second is between business and science (see Figure 2) (Dunkel 2006, p. 28).

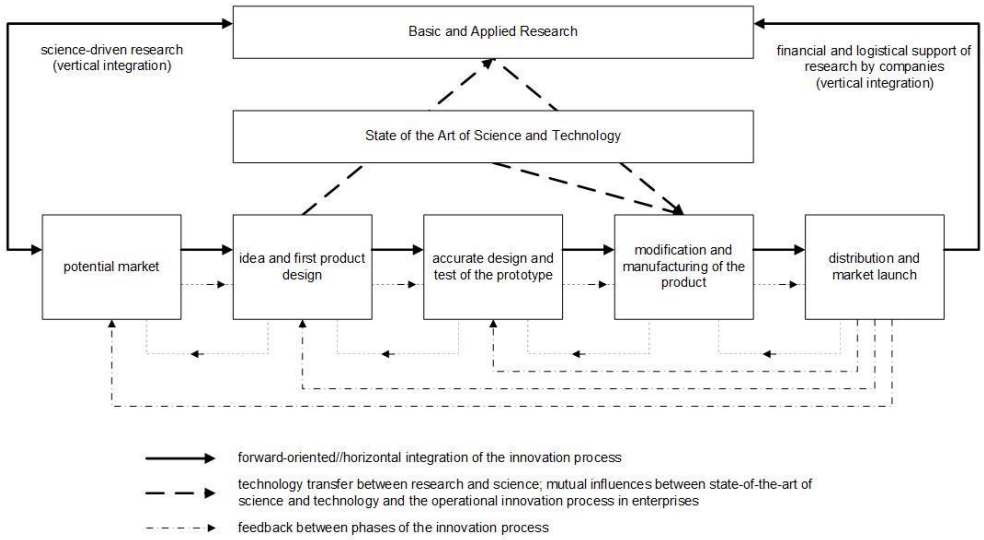

Figure 2: Interactive and dynamic model of the innovation process
Source: based on Dunkel 2006, p. 29

The innovation chain on the corporate level consists of five phases (first interaction type). Perceiving new market opportunities and new science or technology-based inventions with the help of an early warning system is the subject of the first phase. The second phase is realizing the idea and the first product design, and is followed by the accurate design, including the prototype test. The analytical design is important because, "design activity is not a lower level or routine activity, but one which can originate a number of linkages and feedbacks. A design (...) is essential to initiating technical innovations, and redesigns are essential to ultimate success. In many industries, this design activity still incorporates tacit knowledge and technical know-how dating back to earlier periods when production had a weak or even no base in science at all" (OECD 1992, p. 26). The modification and manufacturing of the product is part of phase four. The last phase on the corporate level is the distribution and the market launch (Dunkel 2006).

At the corporate level, feedback occurs in different ways. Short feedback is on the connection between each subsequent (downstream) phase; long feedback connects the demand or the user with the upstream phases (non-adjacent phases). Another linkage exists between the entrepreneurial innovation process to the state-of the-art of science and technology and to the basic/applied research (Dunkel 2006).

The second interaction type describes the linkage between the innovation processes of companies with those of science and research. Here a constant learning and development process takes place in all innovation phases and generates new knowledge and new resources. The development of a new knowledge base is the service of science and research for the companies (Dunkel 2006).

The knowledge base of companies often shares information about technical features, performance indicators, use of materials, or management solutions. This is the generic level of a technology: "On the one hand a technology consists of a body of knowledge, which I shall call generic, in the form of a number of generalizations about how things work, key variables influencing performance, the nature of the currently binding constraints and approaches to pushing these back, widely applicable problem-solving heuristics, etc. I have called this the 'logy' of technology (...). Generic knowledge tends to be codified in applied scientific fields like electrical engineering, or materials science, of pharmacology, which are 'about' technology" (Nelson and Winter 1982, p. 75).

Valuation methods

The use of the linear model also occurs here because it is very well suited for scientific analysis. Nevertheless, we keep the real, dynamic innovation process with its feedback in mind and analyze the valuation methods in terms of dynamics. The analysis of the valuation methods takes place in the following phases:

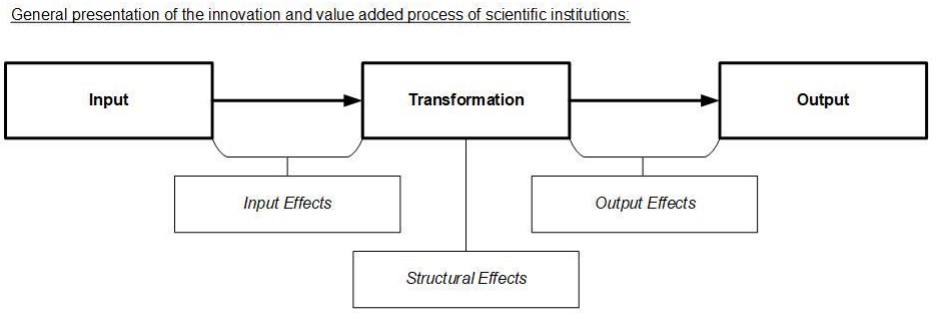

Figure 3: General presentation of the innovation and value-added process of scientific institutions
Source: Own compilation

Input, transformation and output divides the innovation and value-added process of scientific institutions into three phases. Enablers for fulfilling the duty of scientific institutions are the capital, the scientific staff, and the equipment. Duties of scientific institutions are "the operation of research and teaching, further education, and knowledge and technology transfer" (Sauerborn 2005, p. 148) at universities and professional schools or, with reference to the non-university institutions, "the entire spectrum of basic research on some internationally unique infrastructures for industry-related, application-oriented research" (BMBF 2018, p. 81). In non-university research institutions, the teaching and training mission is not as important as it is in universities and professional schools (Franz et al. 2002). The transformation phase combines the provided resources to perform best, e.g. working on research projects, developing new

knowledge and providing knowledge for the community. The dissemination and discussion of transformational findings is extremely important so that they can be of value to the knowledge community and society. Therefore, the output completes the innovation process. Increasing the competence of employees through project work, the public accessibility of research results, patent applications, development of new products and services or creation of start-ups are outputs of scientific institutions.

Table 1:
Valuation methods of the input, transformation and output phase

Input	**Transformation**	**Output**
Multiplier Analysis	Descriptive Analysis	Empirical Analysis of Human Capital Effects
		Location Effect Analysis
Input-Output Analysis	Multivariate Analysis - Logit Regression - Matched-Pair Approach	Network Effect Analysis
Functional Chain Analysis		Keyword Analysis
Self-financing Effect Analysis	Cooperation Analysis	Descriptive Analysis
	Joint Research and Contract Research Analysis	Economic Performance Analysis - Random Effects Approach - Fixed Effects Approach - Tax Multiplier Analysis

Source: Own compilation

The evaluation of the innovation and value-added process and the comparison of the effects of scientific institutions are difficult. On the input side, financial and human capital are primarily considered, and on the output side, knowledge capital. This makes it difficult to compare the effects.

Table *1* gives an overview of the evaluation methods of the input, the transformation and the output of research institutions. The presentation and explanation of each method will follow.

Valuation methods of the input

Multiplier Analysis
Multiplier Analysis estimates the direct and indirect income and employment effects of a scientific institution (Rosner and Weimann 2003; Assenmacher et al. 2004; Glorius and Schultz 2002).

This method goes through the following steps:

1. Determination of the direct demand effects from the outflow of funds of the scientific institution.
2. Estimation of indirect demand effects using a region-specific multiplier value.

Input-Output Analysis
Input-Output Analysis is equivalent to the multiplier analysis described above. The tool for this methodology is the input-output matrix. There are three sectors in this matrix: the supplying, the supplied and the primary input sector (taxes, imports and value added). Here, a regionalization takes place by using the derivative method, since no regional data or regional input-output tables are available. The derivative method is based on an adjustment of general available data, here in the aggregation of sectors, the calculation of the interrelation coefficient, the assumption of a

regional reflection by the national input-output-matrix and the associated determination of the regional preferential rate and the final valuation of the Leontief inverses(Rosner and Weimann 2003).

Functional Chain Analysis
Functional Chain Analysis determines the indirect effects in the first round of impact measurement. The focus here is on the sector-specific employment effects that arise because of the expenditures of the scientific institution. Tools for the calculation of employment effects are the workplace coefficients of individual sectors. This coefficient represents the average financing per job (average turnover of one employee per sector). Therefore, a derivation of the resulting jobs from the amount of expenditure of an institution is possible (Glorius and Schultz 2002).

Self-financing Effect Analysis
The self-financing effect analysis indicates which financial share of the scientific institution is self-financed. Therefore, the following information is necessary:

- the most important tax sources of the federal states: compound taxes (income and value added tax, vehicle tax, transfer land transfer tax);
- its own tax revenue has no influence on the fiscal revenues of the federal states, differences are adjusted by regulations of the German Federal State Finance Equalization;
- revenues of the federal state are defined by the number of inhabitants and the per capita tax revenue;
- the approximation of fiscal per capita revenue is determined by a financial strength indicator and a compensation indicator for each federal state;
- the financial strength indicators define the financial strength of a federal state and the compensation indicator defines the financial need of a federal state.

This self-financing effect results from the fiscal income of an additional inhabitant in the federal state. The analysis of the fiscal income takes place with a limit calculation. The multiplication of the financial strength indicator with the compensation factor, divided by the number of inhabitants in the federal state, results in the fiscal marginal income. Fiscal marginal income multiplied by the number of additional inhabitants (e.g. number of students, new employees in the scientific institutions with origin in another federal state) gives the income of the German Federal State Finance Equalization. This income divided by the expenses for the scientific institution gives the self-financing rate of the scientific institution (Rosner and Weimann 2004).

Valuation methods of the transformation

Descriptive Analysis
Descriptive analysis within the transformation phase brings together regular surveys of companies on their cooperative behavior with a scientific institution. Among other things, the content of these surveys is the answer to the question of whether a company cooperates with the research institution or not. Based on the surveyed companies, the proportion of cooperating companies can be determined. The determination of the cooperation intensity is possible by the number of projects. Further content of the survey is the sector allocation of the (cooperating) companies, turnover, number of employees, work productivity per employee, age of the enterprise, research priorities, most important field of innovation, position in the value chain, product complexity, technology use as well as production and work organization(Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Multivariate Analysis

Multivariate analysis tests the previously established relationships with the help of two consecutive methods and additional variables. The first method is logit regression. The aim of the method is to estimate the connection within a cooperation, to measure the innovation performance of companies and their cooperation intensity. The second method is the matched-pair approach. Here, the comparison of a cooperating company with a defined twin company takes place. This makes it possible to say whether a cooperating company is more successful than a non-cooperating company. By not making parametric assumptions, the matched-pair approach is much more robust than the regression-analytic approaches (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Cooperation Analysis
The cooperation analysis examines whether there is a direct connection between a cooperation with a scientific institution and the company's success. A relationship is measurable via financial ratios. The data used here consists of the European Manufacturing Survey[21]and the ORBIS database[22].Variables on which the relationship is established are the revenues from the main business activity, earnings before interest and taxes (EBIT) and return of equity (ROE) (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Joint Research and Contract Research Analysis
The Joint Research and Contract Research Analysis evaluates the proportion of all collaborative projects involving the respective scientific institution. Data from the federal funding catalog (BMBF) and internal contract research data form the basis of this analysis over time. With this data it is possible to identify partners who begin as collaborative project participants and then become industrial project partners (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Valuation methods of the output

Empirical Analysis of Human Capital Effects
The Empirical Analysis of Human Capital Effects examines the complexity and the transfer paths of knowledge and human capital into the regional economy. Three transfer paths play an important role:

1. spin-offs from the scientific community;
2. cooperation and knowledge transfer between science and regional companies;
3. graduates working in regional companies.

The research design varies from personal interviews to written surveys (questionnaires). The results of the analysis include the number of spin-offs, regional distribution of spin-offs, forms of knowledge transfer (cooperation, contracts, patents, further training), forms of human capital transfer (trainees, graduates, external staff), environmental factors for cooperation, cooperation potential and obstacles, structure of regional enterprises (size, sales markets, innovation behavior), and criteria for the selection of scientific institutions (Rosner and Weimann 2004).

Location Effect Analysis
Location Effect Analysis indicates whether students remain in a region in relation to the regional labor market and the size of the total labor market of a country. The relative size of the labor market defines the expected number of graduates starting their careers in the state. Only the attractiveness/unattractiveness of the regional labor market and the location effect of the

[21]European Manufacturing Survey (EMS) is a consortium of research institutes and universities of several European and non-European countries which analyzes the use of technical-organizational innovations in production; the EMS is organized by the Fraunhofer ISI.
[22]The ORBIS database includes information of 310 million companies worldwide.

university influences this expected number. Surveys and statistical data help to define the needed information for a specific year. The site effect describes how many additional graduates above the average number will remain in the region, just because the federal state finances the scientific institution. Labor market attractiveness describes the deviations between expected and actual numbers of remaining students due to the particular attractiveness or unattractiveness of the regional labor market (Assenmacher et al. 2004).

Network Effect Analysis
Network Effect Analysis examines the involvement of a scientific institution in networks. The evaluation assumes that the formation of networks promotes positive regional development because of rapid access to knowledge. Elements of the analysis are the presentation of the network approach, the emergence of networks with the help of the transaction costs approach, characterization of innovation networks, description of knowledge transfer and the definition of the role of scientific institutions in the innovation system. Empirical surveys of professors and regional companies examine the involvement of the scientific institution in these networks. Both perspectives provide insights on collaboration with other science, businesses and public institutions in the region (number of contacts, contact range, contact allocation, types of contact, content and goals, contact reasons, origin, duration and emergence, obstacles, and other characteristics) (Assenmacher et al. 2004).

Keyword Analysis
Keyword analysis answers the question of when a technology moves from theoretical knowledge to practical application. This method searches for keywords within the abstracts of patent applications over time. The first step of this analysis is the cleanup of abstracts (removal of words without content). The second step consists of the relevance verification of the potentially relevant words. It calculates how often a word occurs in a text, weighted by the number of texts in which it appears at all. Characteristic of the early phase of technology development are broad, descriptive keywords. The application of a technology becomes recognizable in other keywords (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Descriptive Analysis
Descriptive analysis within the output phase compares among other things the macroeconomic effects of universities and non-university institutions. There are effects in terms of third-party revenues, investment expenditures and scientists per capita. Here, annual reports and official statistics are data sources (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Economic Performance Analysis
Economic performance analysis focuses on the impact on GDP per capita and economic effects occurring especially because of third-party revenues. The evaluation of these effects differs, on the one hand the Random-Effects Approach (RE) and on the other the Fixed-Effects Approach (FE). The FE approach is more robust to unobserved, time-constant heterogeneity, but the RE approach is more efficient, more accurate, and less susceptible to outliers (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Tax-Multiplier-Analysis uses the previously determined coefficient of the FE approach for further calculation. Multiplying the coefficient by the adjusted project revenues (income from abroad excluded) results in the absolute GDP effect. This GDP effect indicates the sum of the country´s GDP generated by a scientific institution. With this value and the determination of the tax rate in the corresponding year (total tax revenue divided by GDP), the calculation of the expected tax effect of a scientific institution is possible (tax rate multiplied by the GDP effect).Considering the corresponding financial requirements or public financing (publically funded projects and basic funding) of the scientific institution, a respective tax multiplier is obtained (Fraunhofer-Institut für System- und Innovationsforschung ISI 2016).

Review of valuation methods

The analysis of the methods during the general innovation process shows a focus on the determination of monetary effects. To improve the comparability of the effects, attempts are made to convert knowledge and network effects of the output into monetary units. The differences between the methods on the input side (quantitative assessment of effects) and the analytical procedures on the output side (qualitative assessment of effects) are still formative. Both sides are still put in relation to each other in order to obtain better statements on the effectiveness of expenditures. This means that a precise statement on the quality of research is neglected here.

The transformation phase of the innovation process has so far received little methodological support and reveals the research gap. Working in projects, one of the core activities of a research institution, has so far been little or not at all investigated. Projects with external companies and partners are of interest here because this work has internal and external effects. When the projects were examined, this usually had a financial background in the methodology. For this reason, besides the extension of the quantitative project evaluation, the qualitative analysis of the projects carried out is important for further work.

The origin of effects in the transformation phase is the cooperation with partners from science, business, industry, culture, politics and society. Due to the cooperation, research institutions have further influences (see Table 2). Therefore, methods are needed to examine and evaluate cooperation, network activities and cooperation between companies – methods that deal with the evaluation of projects – in order to take a closer look at this cooperation.

The evaluation of the effects on the subsystems described in Table 2 has its limits. In particular, the attribution, utilization and the occurrence of effects with a time and place lag poses an enormous methodological problem. Such impact assessment requires a large time frame and an immense database.

Table 2:
Effects on subsystems

Subsystems	**Regional environment**
political	higher political participation, better organization of political processes
demographical	size, structure and mobility of the population
economic	economic structure, labor mobility
infrastructural	housing market, transport, medical infrastructure, shop density
cultural	greater supply and demand for cultural events and facilities, general influence on the cultural climate
pedagogical	educational participation and quality
social	quality of life, image and identity of the region

Source: Haisch 2008, p. 18

The data used so far in the methods consist of individually recorded databases of companies, research institutions, the federal government or the respective federal state. These are neither structurally, conceptually nor content-wise identical and contain hardly any information on effects on the regions. At this point, it would make sense to define uniform mandatory information for project documentation and to add important categories.

Uniform mandatory information can be, among other things, the distinction between grant recipient and implementing agency in order to clearly assign projects to regions; to use a

generally applicable industry categorization (e.g. WZ 2008[23]) in order to assign companies to the industry in which they have the largest share of value added (gross value added at basic prices); a common understanding of the classification of enterprises according to their size (micro, small, medium-sized, large enterprises) and a general classification of projects (project type, project size, project complexity). With regard to the project type, it is interesting to know whether it is an individual project, a collaborative project or a joint project, whether it is an industrial project or a public project, and whether it is an initial project or a follow-up project.

As additional categories for project documentation, it would be useful to distinguish between innovation types (on the one hand in the project objective and in the actual project result) in order to make a more visible characterization of regions or developments. Several distinctions can also be made at this point: object of the innovation, scope of change of the innovation, range of the innovation, driver of the innovation, market impact of the innovation, etc.

If the project evaluation is extended, it makes sense for various reasons to combine the different approaches of project documentation, to design an appropriate monitoring system and to develop additional indicators for regional development. These are indicators which, due to a lack of data, can only be determined by way of example, but represent a first approach, an approach that exemplifies the regionality, frequency, intensity, dynamics and characteristics of regional cooperation.

Scenario for the regionality, frequency and dynamics of projects

The evaluation of the *regionality of the projects* or the localization of all project partners allows statements to be made about the spatial area in which the work of a research institute has an impact. When looking over several years, this spatial area should be extended, but at the same time should focus on a specific catchment area. This means that when a research institute is founded or established, it can be assumed that its activities in the first year will be concentrated in a narrow radius around the location. Over the years, this circle becomes larger and larger, crosses national borders and does not neglect its own environment. As a result, a determination of project shares at local, regional, national and international level could help to identify and counteract certain developments in cooperation.

Scenario Regionality: The imaginary data set for the cooperation in projects has changed as follows in recent years, as Table 3 demonstrates.

Table 3:
Scenario Regionality

	2000	2010	2020
German Federal State	50%	40%	35%
Germany	35%	40%	45%
Europe	10%	10%	15%
World	5%	5%	5%

Source: Own compilation

With such a distributional development in cooperation, the regional share is steadily decreasing, in contrast to the increasing share in Germany and later in Europe. Due to its location, the research institution has the task of supporting the region in global competition, contributing to positive development and orienting its research topics to the regional needs, especially in the surrounding area. It is also worthwhile to divide the regionality into several

[23] WZ 2008 is the German Classification of Economic Activities Edition 2008 and the equivalent of the European Classification of Economic Activities (NACE = Nomenclature statistique des activités économiques dans la Communauté européenne)

dimensions, such as municipalities, federal states, neighboring federal states, regions of Central Germany or old/new federal states, in order to obtain a clearer picture of the regionality.

The *frequency of cooperation* refers mainly to the interaction between companies and research institutions. Here the innovative spirit of companies can be deduced. In other words, the more often projects are carried out and the less time passes between projects, the more innovative companies are.

It is important to classify the companies according to their size and to divide the projects into funded and nonfunded. The size of an enterprise is associated with the ability to implement its own research projects. This means that large companies have their own research and development departments, carry out their own projects, seek support from external sources less frequently and, if necessary, commission these research institutions directly (non-subsidized projects). Small companies, on the other hand, do not have their own research sections, therefore do not carry out their own innovation projects, look for a competent partner for this activity and are usually looking for funding to implement a project.

Scenario Frequency: The imaginary data set for the frequency of regional cooperation, over a defined period, considering the project type and the company size, is shown in Table 4:

Table 4:
Scenario Frequency

project type	funded			nonfunded		
company size	small	medium	large	small	medium	large
number of projects	25	30	10	10	15	30
average time between projects (in months)	24	18	12	36	24	6

Source: Own compilation

With such a distribution of the number of projects, SMEs cooperate particularly intensively with research institutions in funded projects and large companies are more likely to cooperate with research institutions in nonfunded projects. It is also clear that the smaller a company, the longer the average time between both funded and nonfunded projects. These companies consider each innovation activity very carefully in order to minimize the economic risk. Of great interest here is the question of the interplay between funded and unsubsidized projects, i.e. how many unsubsidized projects are initiated by a subsidized project.

The *dynamics of regional cooperation* are based on the evaluation of the frequency of projects. Here, the duration of the projects, the sum of all project durations and the time coverage over the period between the first and the last project are decisive. Thus, a certain regularity can be identified in the cooperation between companies and research institutions.

For the evaluation of the temporal coverage two factors of regional cooperation must be determined. One is the time from the beginning of the first project to the end of the last project and the other is the sum of all project durations.

Scenario Dynamics: The imaginary data set for the dynamics of regional cooperation are to be depicted as in Table 5 over a defined period, considering the type of project and the size of the company:

Table 5:
Scenario Dynamics

project type	funded			nonfunded		
company size	small	medium	large	small	medium	large
number of projects	25	30	10	10	15	30
sum of project durations (in months)	150	270	180	30	90	360
average project duration (in months)	6	9	18	3	6	12
observation period first and last project (in months)	60	48	36	36	30	24

Source: Own compilation

Such a distribution of the time factors of projects shows that the average project duration varies depending on the type of project and is higher in funded projects than in projects implemented with an organization's own funds. This also results in a lower sum of project durations, which means that projects have a longer time interval and a correspondingly longer observation period[24]. Looking at individual companies, the phenomenon of a longer time span between projects than the sum of the project durations can occur, and this can mean that the cooperation is only covered for a short time.

Monitoring system of the regional project cooperation

At the end I would like to briefly introduce the monitoring system with individual illustrations. Ideally, such a system should be applicable to every research institution in Germany, characterize the work of a research institution even better and reveal differences in the project work of regions. In addition, it can be used as an instrument for the targeted management of project funding to strengthen structurally weaker regions.

Regionality can be displayed in heat maps (Figure 4). All projects of a research institution in Magdeburg (Saxony-Anhalt) with companies in the same federal state are combined here. The dashboard is designed in such a way that the presentation adapts to the project type (all, funded, non-funded, etc.), the calendar year and the region (federal state, own federal state plus neighboring federal states, new and old federal states, etc.) depending on the settings selected.

[24] Oberservation period is the time between the first project (project start date) and the last project (project end date) with one project partner. That means, every project partner has an individual observation period.

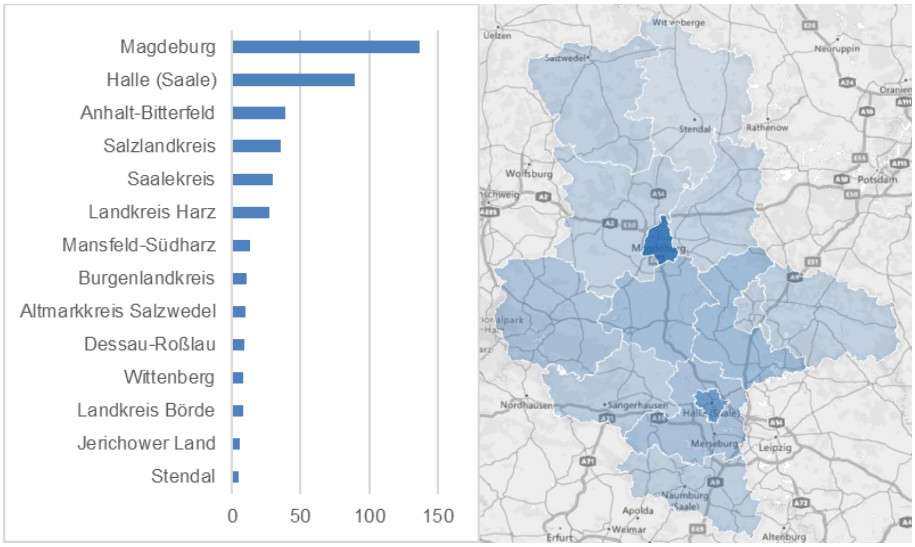

Figure 4: Monitoring of regionality: number of project cooperation of a research institution based in Magdeburg by county districts within the Federal State of Saxony-Anhalt (imaginary data left, heatmap right), darker colors mean more project cooperation
Source: Own compilation

The frequency of regional cooperation is presented in Figure 5 as a comparison between funded and unfunded projects; the calendar year can also be selected here. In the further course of the dashboard development, the process of trust building between the project actors will be examined. This also determines how often and in what time interval a direct industrial project arises from a funded project. By showing the frequency of regional cooperation in funded (left side) and nonfunded projects (right side), the need and demand in the region becomes clear. The more frequently cooperation is requested in funded projects, the greater the competence in writing project proposals must be developed in the research institution. And vice versa, the more frequently cooperation is sought in nonfunded projects, the greater the professional and technological competence must be in the research institution.

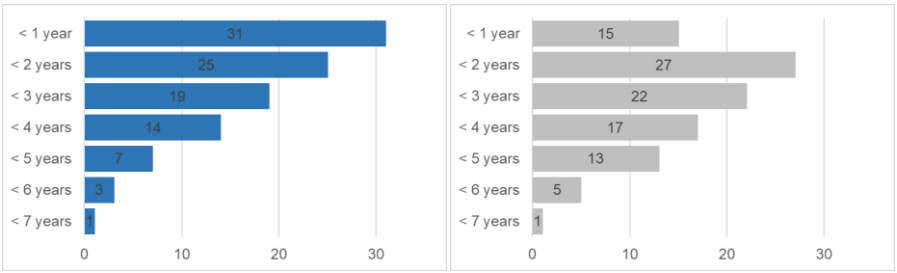

Figure 4: Monitoring of Frequency in funded (left) and nonfunded projects (right)
Source: Own compilation

The dynamics of regional cooperation is also presented as a comparison of funded and nonfunded projects in Figure 6., Project characteristics such as durations and intervals between follow-up projects become clear here. In relation to specific clients or project partners, peak times are discernible which indicate technological or thematic problems within the company.

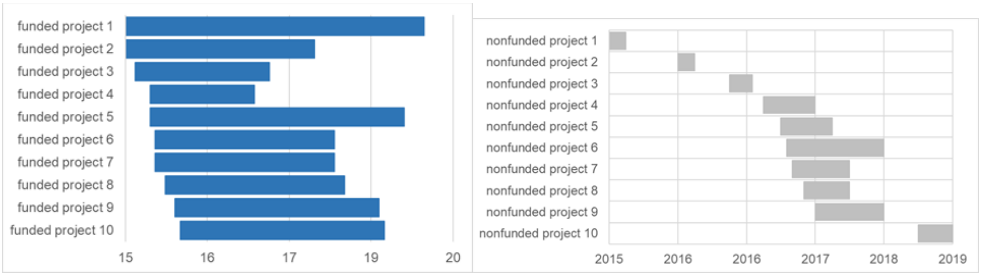

Figure 5: Monitoring of dynamics from 2015 to 2020
Source: Own compilation

With these and other characteristics of regional cooperation represented in the monitoring system, innovation developments in regions can be better evaluated and controlled. Decision makers can use this system to better assess and support regions in their innovation work. A requirement for the quality of the dashboard is, as already mentioned, the use of uniform terminology, data collection of projects by different actors of the innovation system and the compilation of these data. In this way, both a short-term assessment and long-term development can be depicted.

Collection and interpretation of further project characteristics is the subject of future work. The next steps will be to expand the theoretical monitoring system of regional cooperation, which is only abridged here, and to identify the appropriate form of presentation. The focus remains on the transformation phase of the innovation process.

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BOOK REVIEW

Szávics, Petra

Philip McCann (2015). *The Regional and Urban Policy of the European Union: Cohesion, Results-Orientation and Smart Specialisation.* Cheltenham, UK& Northampton, MA, USA: Edward Elgar Publishing.

McCann's book aims to explain the logic underlying the Cohesion Policy reform of the European Union introduced starting with the 2014-2020 programming period, with an accent on smart specialisation. Smart specialisation is regarded as a key aspect of the new approach, closely interlinked with other changes introduced, following the recommendations of the Barca report, and a concept in line with the latest approaches to regional development. Addressing policy-makers and academia, the well-researched book reflects the author's opinion on the subject as both a researcher and an advisor on regional policy to the European Commission. The volume is split into 7 chapters, briefly presented in the following paragraphs.

The first chapter presents the starting point of the debates that led to the reform, putting an accent on the EU2020 Strategy and the impact of the 2008 global financial crisis. This document marks a shift from the mainly sectoral approach of the previous 'Lisbon Strategy', reflecting a multi-dimensional understanding of development and economic growth. As regards the second aspect, the author argues that despite economic integration, European regions present great heterogeneity, resulting in an uneven distribution of the effects of crises, threatening unity and calling for new measures.

Chapter 2 goes further into depth regarding aspects of heterogeneity along six socio-economic characteristics. The author stresses that due to the unique attributes of local and regional economic systems, growth and development problems can only be solved by taking "explicitly (…) these specific features and differences into consideration" (p.45). This section provides grounding for further discussions linked to Cohesion Policy reforms, which are presented in Chapter 4, preceded by one that gives an overview on the origins and evolution of the policy. Making reference to four programming periods – between 1988 and 2013 – in Chapter 3 the author points out that while the European Union "has changed dramatically during this period" (p. 49), apart from some adjustments, the policy objectives, its logic, and its architecture remained generally the same. One other argument made is that even though policy implementation has had generally positive economic effects, conclusive evidence is missing in this sense. Outcomes present differences on regional and policy level, depending on the quality of governance. For assuring a more consistent impact, one of the bottlenecks that needs to be overcome is the "economic, geographic, institutional and governance diversity of the regions" (p. 70). In parallel clearer policy objectives should be defined.

The fourth chapter presents in detail the rationale of the reform, making reference to the Barca report and its nature from an economic geography and institutional perspective. Changes introduced represent a shift from the previous sectoral and mainly top-down approaches and refer to: i) its role as a development policy allowing for differentiation based on regional characteristics and application of a bottom-up approach, ii) coordination between different actions of the EU, iii) the use of conditionalities to avoid 'principal-agent' problems, iv) orientation towards results through monitoring and evaluation, v) multi-level governance and partnerships to foster the involvement of all levels, but also to facilitate learning between regions, vi) changes in geographical coverage, by introducing the category of 'transition' regions

and accent on urban issues, and vii) the role of innovation in growth and development, through smart specialisation.

Innovation and smart specialisation are the focus in chapters 5 and 6. Chapter 5 contains a theoretical introduction, describing changes in our understanding about the role of innovation in economic growth and regional development, as well as regarding innovation policies. According to recent theories such policies should be designed at the regional level, taking into consideration regional factors, as well as geographical, technological, cultural and cognitive proximity relations. Chapter 6 on smart specialisation presents the concept as it originated from the discussions addressing the transatlantic productivity gap. Originally it was a non-spatial concept, offering a new framework for policy prioritisation, maximising the outcomes of entrepreneurial activity. Since key components of the non-spatial concept –*i.e.* 'domain', 'relevant size', 'level of connectedness' – can be adopted to a geographic context, using the terminology of economic geography ('relatedness', 'embeddedness', 'connectivity'), this was applied to the regional context. Incorporating aspects linked to governance, result orientation, conditionalities and a bottom-up approach, smart specialisation, as introduced in the reformed Cohesion Policy became a "novel way to provide a policy-prioritisation logic appropriate for the context" (p. 195) of any type of region, including non-core ones, helping them to diversify based on existing assets and activities, "fostering entrepreneurship and innovation in ways which are beneficial to the wider economy" (p. 198).

Chapter 7, offering conclusions, underlines again that smart specialisation is for all types of regions and this characteristic is also a novelty of the reform: *"*The movement towards an innovation-oriented policy as the core of the development agenda in weaker regions is a major shift of emphasis for EU Cohesion Policy*"* (p. 204). Through this approach, such regions are able to direct available funding towards areas where the biggest impact can be expected. However, the author underlines that for reaching objectives linked to development, both quality and reform of institutions and "good multi-level governance arrangements" (p. 205) are absolutely necessary. Institutional aspects recur in this final chapter, representing a potential bottleneck in successfully implementing reforms, besides the weaknesses that are identified linked to certain provisions from the regulations (e.g. the mechanism of the performance reserve, the N+3 rule and the broad definition of investment priorities). Some examples of institutional resistance to the reform logic mentioned refer to the adoption of 'tick-the-box' approaches linked to the actual involvement of partners in defining clear objectives, to place-based and bottom-up logic, as well as to rental-capture problems linked to policy design and potential failure of the European Commission in assuring compliance with all aspects of the reform. McCann's final, perhaps key recommendation is that the European Commission should act to ensure that major aspects of the reform, especially those regarding partnership and multi-level governance arrangements, are enforced and non-compliance with the "good governance and accountability principles" (p. 215) should be sanctioned rather than other aspects of weak performance.

While the book was written and published at the beginning of the 2014-2020 programming period, it has not lose relevance, since – as the policy recommendations for the next programming period reflect – the same reforms are reinforced for 2021-2017. Greater emphasis on the definition of policy objectives, the growing importance of smart specialisation, underlining the significance of place-based and bottom-up approaches and creating synergies between different actions are such examples. Interestingly, there are some changes introduced in the policy framework that are linked to aspects criticised by McCann related to the provisions of the previous Common Provision Regulation, for example giving up on the N+3 decommitment rule and returning back to N+2, or on the application of the performance reserve. Additionally, instead of ex-ante conditionalities, the European Commission is proposing to make declarations of expenditure depending on the fulfilment of enabling conditions throughout the whole programme cycle. As far as smart specialisation is concerned, the former ex-ante conditionality linked to the existence of a strategy on the national and/or regional level is replaced by an

enabling condition that explicitly refers to the good governance of such strategies, including the effective functioning of the entrepreneurial discovery process, the key element of the bottom-up approach and stakeholder involvement. Thus, from the perspective of the preparations for the next financial exercise, this book is very much recommended to be read not only by those doing research on smart specialisation but also by experts involved in policy design.

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Notes for Authors

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- The maximum length of a paper that can be accepted is 35,000 characters. An abstract in five lines followed by 3-5 keywords is to be given at the beginning of the paper.
- The text is to be submitted in file by e-mail. (Any version of MS WORD can be used for saving it.)
- A short English summary (approximately 10-15 lines) of the paper is to be submitted together with the English captions of figures and tables.
- Tables are to be incorporated in the text in the appropriate format. Their exact place in the text and captions are to be signalled by numbering.
- A maximum of 4-5 figures can be included in a paper for reasons of length.
- Figures (e.g. maps, diagrams, drawings, photos) and the tables are to be appropriately formatted and incorporated in the text. Figures produced by photocopying and/or scanning cannot be accepted, for their quality is not suitable for the press. It is not possible to publish colour figures. Figures and tables are to be numbered separately (e.g. Figure 1, Figure 2, Table 1, Table 2.), and their references (Figure 1) or (Table 1) given in italics in the right place in the text in brackets.
- The caption of a figure is to be given below the figure, in the middle of the line, and the caption of a table is to be given above the table in the middle of the line. Figures and tables are to be followed by the source. If the figure is the author's own work, then 'Source: author's own work or Author's own calculation' is to be used.
- References to literature are to be given in every case: the author's name and the year of publication in brackets. E.g.: (Conti 1993). For quotations the page is also to be given. E.g.: (Conti 1993, p.76) or (Conti 1993, pp.76-86). References are not to be given as footnotes, but only in the above format in the body of the text.
- The list of literature should include only works with reference to them in the body of the text. Every work referred to should be included in the list of literature.
- Notes are to be given as footnotes in a numbered format. Notes are to include additions to the main body of the text, and they should not contain explanations of figures or references.
- The text is to be followed by the list of literature, in the following formats (Do not forget the DOI numbers!):

  Books: author (year of publication): Title of the work, name of publisher, place of publication.

  Periodicals: author(s) (year of publication): Title of the paper. Name of the periodical. (Number of volume), number of issue, numbers of the first and last pages of the paper.

  Books with several authors: author(s) (year of publication):- Title of the paper. In: Title of the book. (szerk. or ed(s), or Hrsg.: Name(s) of editor(s)), name of publisher, place of publication, numbers of the first and last pages of the paper referred to.

Examples:

Cronauge, U. (1992): Kommunale Unternehmen. Erich Schmidt Verlag, Berlin.

Alchian, A.-Demsetz, II. (1972): Production, information costs and economic organisation. American Economic Review (XII.) 2. pp. 775-795.

Péteri G. (1991): Az önkormányzatok és oktatási intézményeinek viszonya, finanszírozási kérdések. In: Önkormányzat és iskola. (szerk.: Kozma T.) Oktatáskutató Intézet, Budapest, pp. 122-154.

Thank you!

The Editorial Board