

# **Building Partnership**

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## Contents

## Contributions

Issues of Porter's Competitive Advantage Model form the Point of View of a South-Transdanubian Small Settlement	9-24
DUCZON Árpád	
Impact of Globalization Tendencies and Competitiveness Factors on Operating Surplus of Enterprises in Various Region Types	25-44
HUTTMANOVÁ Emília, VALENTÍNY Tomáš, GIRA Dominik, NOVOTNÝ Roman	
Smart City Solutions in the Capitals of the EU Countries	45-58
OROSZ Daniel, PÉTER Zsolt	
Development of Smart Traffic Evaluation- and Influence- Modules Based on Non-Declarative Rules of Artificial Intelligence	59-73
PITLIK László, PITLIK László (Jr), PITLIK Marcell, PITLIK Mátyás, GYIMESI Áron	
The Relationship Between Public Transport and Tourism in Budapest	74-87
REMENYIK Bulcsú, SIKÓ Botond, SZABÓ Lajos, GUTH László	
Resilient Small Towns in Hungary?	88-97
SZABÓ Pál, VÖRÖS-TORMA Katalin	
Hungarian-Slovak Cross-Border Research on the Labor Market Opportunities of Disadvantaged Job Seekers	98-108

VISZTENVELT Andrea, SUHAJDA Csilla Judit



Presentations
---------------

Does Size Matter? Different Paths of Hungarian Ethnoregional Parties in Neighbouring States	109-123
BARANYAI Nóra	
Perception of Social Entrepreneurship Among Entrepreneurs in Slovakia	124-137
BĽANDA Jozef	
Key Factors of Silicon Valley Cluster's Success and Excellence	138-151
BURGER Peter	
Educational Effectiveness Across Selected Countries DANCÁKOVÁ Darya	152-160
Issues of Porter's Competitive Advantage Model Form the Point of View of a South-Transdanubian Small Settlement	161-175
DUCZON Árpád	
Rural Innovation: Smart Ideas and Good Practices from Hungary	176-191
HONVÁRI Patrícia	
Smart Cities and (Start-Up) Communities	192-210
HUDEC Oto, LAVČÁK Marek	
Smart Communities in a Global Context - Tendencies and Challenges	211-240
JÓZSA Viktória	



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Education for Local Development of Rural Areas – ELDORA	241-257
KIRAĽVARGOVÁ Henrieta	
Technology Context for Resilient City - Case of Košice on the Tourism Map	258-268
KOĽVEKOVÁ Gabriela, LIPTÁKOVÁ Erika	
Cross-Border Cooperation Programme - Analysis of the ENPI CBC HU-SK-RO-UA 2007-2013	269-280
KOVÁČOVÁ Barbora	
Empirical Analysis of Intangible Assets as Determinants of Firm Performance: Evidence from Western and Northern Europe	281-300
MRÁZKOVÁ Silvia	
Impact of Globalization Tendencies and Competitiveness Factors on Operating Surplus of Enterprises in Various Region Types	301-312
NOVOTNÝ Roman, VALENTINY Tomáš, HUTTMANOVÁ Emília, GIRA Dominik,	
Smart City Solutions in the Capitals of the EU countries OROSZ Daniel, PÉTER Zsolt	313-330
Development of Smart Traffic Evaluation- and Influence- Modules Based on Non-Declarative Rules of Artificial Intelligence	331-345
PITLIK László, PITLIK László (Jr.), PITLIK Marcell, PITLIK Mátyás, GYIMESI Áron	
Urban Development in the Light of Climate Change	346-353
SCHVALB Michal	



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The Relationship between Public Transport and Tourism in Budapest	354-374
SIKÓ Botond, REMENYIK Bulcsú, SZABÓ Lajos, GUTH László	
Smart Governance and Participatory Citizenship SINČÁKOVÁ Žofia, KEPIČOVÁ Adriana	375-395
Theoretical Background and Problems of Health Care Efficiency with DEA Models SOPKO Jakub, KOČIŠOVÁ Kristina	396-409
Unconventional Monetary Policy Impact on Foreign Exchange - Evidence from EU	410-421
ŠAFÁR Leoš, RODÁKOVÁ Renáta	
Measuring the Potential of Green City: Case Study from Slovakia	422-433
ŠEBOVÁ Miriam, PAĽUCHOVÁ Lucia	
Socio-Economic Resilience and Vulnerability of Regions	434-477
ŠISEROVÁ Monika, HUDEC Oto	
The Importance of Regional Development in the Office of Košice Self-Governing Region	478-546
ŤAPÁK Peter	
Cross Border Cluster Initiatives for Economic Development Support	547-575
URBANČÍKOVÁ Nataša	
European Higher Education in the World: Case Study of Reforming Master Programmes in Finance in Armenia and Moldova	576-587

URBANČÍKOVÁ Nataša



Hungarian - Slovak Cross-Border Research on the Labour Market Opportunities of Disadvantaged Job Seekers	597-608
VISZTENVELT Andrea, SUHAJDA Csilla Judit	
<b>Resilient (?) Small Towns in Hungary</b> VÖRÖS-TORMA Katalin, SZABÓ Pál	609-625
Head in the Clouds: Digital Learning to Overcome School Failure	626-662
ŽELINSKÝ Tomáš	
On the Transmission of Community Norms: The Case of Segregated Roma ŽELINSKÝ Tomáš	663-686



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## Issues of Porter's Competitive Advantage Model form the Point of View of a South-Transdanubian Small Settlement

#### Árpád DUCZON<sup>1</sup>

#### Hungary

#### Abstract

What are the decisive factors of the competitiveness of a settlement? Its location in the region, its historical, economic, social situation in the region concerned or the activity of the local economic and social operators, or else the absorption capacity of the resources and capital. Local, micro-regional development factors such as infrastructure supply, the state of public utility networks, number of economic operators and their ability to enforce their interest are inevitable for quantitative and qualitative growth. Without them, growth is almost impossible. Where there is no stable economic, social basis for recovery, the opportunity to follow a solid pathway of developmental is unthinkable. Human factors of development such as the state, competitiveness y of the local social care system, the primary and secondary education system, the level of development and quality of the health care system also have a major impact, and even determine the overall competitiveness of a micro region or a settlement. The above economic and human aspects together can define the state of a region. In the case where the local community, the local area correctly defines itself in the global competitive environment, it is possible to define adequate beakpoints and to start quantitative and qualitative developments along these core competencies.

**Keywords:** Competitiveness, Economic Potential, Core Competencies, Rural Development, Competitive Advantage.

JEL Classification: R11

#### 1. Introduction

In this study I would like to examine Porter's competitive advantage model (1990) in the a field of rural development. First I focus on the description of the Diamond Model on the level of settlements. Then I give a short overview of the South-

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Transdanubian region and highlighted the status of Abaliget village in the field of economic growth, infrastructure, labour market, Finally I try to collect the opportunities of local competitive advantage and define the possible breakpoints.

#### 2. Description of the Diamond Model on the level of settlements

#### 2.1. Basic items of the Porter's Diamond Model

**Supply of resources:** the production and service factors defined by Porter can also be determined for a settlement. One can consider the natural resources that a particular settlement and municipality have, as well as the infrastructure that presents the development of a given settlement in terms of physical infrastructure. These factors can accurately identified even for for a settlement. Financial resources can be replaced by the municipal budget, while the intellectual potential of the people living or working in the settlement can be account for human resources. Knowledge base can be interpreted in a collective sense as the collective mental and networking capital of the community concerned.

**Terms of Demand:** according to Porter's interpretation, terms of demand is basically users' demand. Services provided by a settlement can be market-based or social. Based on practical observations, it can be established that, in a market-based competition, a settlement can gain the same competitive advantage as a classical business enterprise in the provision of services. In the 21st century, settlements in many cases act as market players in a market. In the area of social services, it is harder to identify a competitive situation, but there are obviously illustrative examples, such as current German social services, which is one of the primary targets for migrant communities.

**Supporting and related industries:** according to Porter's view, organizations are competing independently but are related to many other companies: suppliers, additional buyers, sales groups, other vertical and horizontal market operators. These players could be identified in the life of a settlement as operators who are on the input or output side of settlement's production and service activities. They



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include public utility service providers, institutional operators that appear on the input page, while the output side features partly economic operators, and non-profit operators as well.

**Corporate strategy, structure and rivalry:** the position of a settlement in global and national competition is fundamentally affected by the strategy to be implemented. If there is no well-defined organizational strategy with realistic goals, then it cannot go through quality development through its activities. This is based on a well-thought out and operated organizational structure, which is an indispensable part of a successful strategy. That is complemented by the benefits of continuous rivalry that are driven by the intention for continuous improvement. This is often one of the strongest motivating forces in the life of a settlement and its competitive situation in the region.

**Government:** according to our understanding, governmental factors include the legal, statutory\* and regulatory environment surrounding the settlement. Since a settlement de jure is a part of the general government subsystem, it can be considered as part of the state apparatus itself, but as a separate legal entity which, in some cases has partial, but sometimes full economic independence, it can be clearly regarded as a competitive market operator. Government policy can affect the competitiveness of a settlement through several factors. They include, among others, tax policy, financial regulation, regulatory environment for competition. The settlements themselves are also legislators, as they have some power in decision-making, which can also have a major impact on the competitiveness of a settlement.



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Figure 1 Source: Porter, 1990

# **3.** A short description of the economic situation of Baranya County and the South Transdanubia region

#### 3.1. Characteristics of the Region

As far as economy is concerned, the European Union consists of highly differentiated regions, bordered by more or less well-defined break-lines. These break-lines are running along both in Europe and in Hungary. While the developing Western market economies are characterised by high-level employment and high productivity, the opposite is true in the Central and Eastern European countries, including Hungary. The former socialist (East European) countries are characterized mainly by the dominance of their Capital city and the great differences between the regions. Due to this fact, there are relatively few development zones -



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that is, a coherent region of the same development - in the countr, Hungary is mostly dominated by underdeveloped, peripheral regions\*. Considerable competitive potential is only seen in the case of Central Hungary and Western Transdanubia, while the other regions are seriously left behind and fall into categories with low competitiveness. (Rechnitzer 2016: 46-47) Accordingly, there is a so-called (large) regional fault line, separating developing and not - or just slightly - developing zones evolved along the line. This separation lies above the Balaton region and below the Central Hungarian region. The county of Baranya and the village of Abaliget belong to the latter, i.e. the less developed region.

In Baranya County, following the decline and demolition of the mining industry, the industrial structure was unable to regenerate. The closure of the mines resulted in the loss of about 27,000 jobs. In 2011, in terms of industrial production per capita, Baranya came last in the country. This situation has not changed ever since.

#### 3.2. Economic Situation Analysis

Studying the relevant GDP data, it can be concluded that while the population of Baranya County account for 3.9% of the country's population in 2011, it generates only 2.7% of the gross value added of the country. Regarding the distribution by sector, it is well-established that agriculture has become one of the strongest added value industries. Agriculture, forestry and fishing represent are approx. 6% of the national results. (Regional Development Concept of Baranya 2013: 56).

In Baranya County, gross domestic product per capita was 71.1% of the national average in 2007, while it reduced to 67.6% in 2010 and in 2013 it was only 65.8%. The continuous decrease is clear. In 2010, the county ranked 13th of the 19 counties based on GDP per capita, and this position has been characteristic for many years. Based on the 2013 figures, the situation deteriorated even further, and we fell back to the 14th place. (Baranya county in figures 2014:14; Baranya County Regional Development Concept 2013:56)



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#### 4. The Village of Abaliget

#### 4.1. Geographical location

Abaliget is a settlement in the Pécs district, in Baranya County, found in the South Transdanubian region. The area of the village is approx. 1700 hectares, of which 96 hectares is residential and recreational area. The population of the settlement, based on the data of the Town Archive of the Central Statistical Office was 654 persons on January 1, 2017. According to the 2011 census data, the population of the village was 607. Thus, the population of the shows a slightly growing trend. The distribution of the population in Abaliget in terms of age is as follows: the age group between 15-39 years of age is 35%, the age group 40-59 is 33%, and 13% of the population is aged 14 or over (CSO Area Data - Census 2011).

Due to the geographic characteristics of the village, agriculture, and more specifically forestry is a source of livelihood for the inhabitants of the settlement. However, due to the natural features of Abaliget, tourism is considered to be the most important economic sector. The village has significant touristic values. Abaliget boasts the only dripstone cave in Southern Transdanubia, which has been opened to tourist since 1958 and can be visited from March to October every year. The cave has been used not only for tourism, but also for educational and therapeutic purposes, but the climate of the settlement is also suitable for the therapeutic use of airborne diseases. Further thematic attractions and leisure programs are connected around the dripstone cave: The Bat Museum, the Boating and Fishing lake, as well as several educational trails in the settlement that connect the village to the touristic circulation of the Mecsek mountains.

#### 4.2. Traffic and Transportation Infrastructure

In the light of the above, it is clear that the location and characteristics of Abaliget offers many opportunities. However, certain factors that stimulate the local economy are not able to promote the dynamism of the settlement's economy due to their current structure and state of development. The opportunities that could be



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competitive advantages for the settlement are also a competitive disadvantage. The primary reason for this is the closed characteristic of the South Transdanubian region, thus the Baranya County and the Pécs district in terms of road transport and traffic.

The closed character of the county has improved by the construction of the motorway towards the capital. However, the main transport and traffic problem is the absence of the county's south and east-west traffic corridors. It is not possible to cross the 50km-long southern border section of the Dráva river. In addition, the region's internal transport situation is also poor. At Mohács, the international cross country harbour is not exploited, despite the fact that the county's water-traffic characteristics are excellent. The railway network is defective, passenger transport has ceased on several sections, and many additional railway lines are in danger of being closed due to low utilization. The development of the railway network would be highly important, as the capital is not available by means of railways from the south and east parts of the county. Based on public surveys, public transport is unsatisfactory, it does not help the employment situation. (Area Development Concept of Baranya County, 2013:7) This is a major problem affecting small villages and small settlements far from the county seat.

#### 4.3. Human Infrastructure

In the following, the economic activity of Abaliget's population is analysed. Being one of the most important human factors, this aspect can determine the situation of the region and the settlement. In order to be able to define itself correctly in terms of its economy, the settlement should offer economic stability to the local population. Based on stability, adequate breakout points can be defined. Along the points of breaking out, the main trends of core competencies will emerge, whereby local quantitative and qualitative development can begin. The main issue is how much the population's labour-market situation determines the competitiveness of the settlement and how it can be positively influenced.



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Regarding the income and wealth of the Abaliget families, the general financial situation of the population can be considered acceptable due to seasonal work and casual work related to tourism. It should be pointed out that, despite the fact that renting out homes for holidaymakers are mainly typical of resort areas, one of every 20 families in the settlement supplement their income in the summer by letting out a part of their houses (Local Program for Equal Chances 2013-2018). In Abaliget, the number of taxpayers, i.e. the population having taxable incomes per 100 inhabitants is somewhat higher (46.26%), than the national (45.67%), the Baranya-County (44%), the Pécs district (44.25%) averages as well as the relevant figures of the Southern Transdanubian region (44.38%). (TEIR 2018)

#### 4.4. Local labour market and public work program

Considering employment and locally available job opportunities, it can be established that the village can provide a low number of permanent jobs. The largest employer is the municipality and its institutions, where the total number of civil servants and public employees is 9, and 3 persons perform physical work. They are all local residents.

Public work program emerged as a new tool for managing unemployment in 2011; start-up work programs have become the most important state resources of disadvantaged villages and small towns. The new uniform public employment provides eight hours of long-term employment instead of the former six, with a budget of 110,000 HUF per public employee / month. The government supports 100% of the wage costs and contributions of public employees and, to a certain extent, settlements can apply for subsidy for the purchasing equipment. (Váradi 2016: 30-35)

Abaliget usually provides employment for 20 to 25 people under the public employment program. In this context, most people participated in the Start public employment program in the field of tourism and tourism projects, ground water management, maintenance of agricultural dirt roads and in traditional social work programs.



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#### 4.5. Unemployment indicators

Unemployment alone cannot show or explain the economic competitiveness of a settlement concerned, but it reveals a lot about the general situation of the labour market. In Abaliget, the number of registered unemployed people is as follows in 2009: 69 people, 58 people in 2010, 66 in 2011, 65 in 2012, 44 in 2013, 35 in 2014 and 47 in 2015 respectively (TEIR 2018). These figures are in line with the situation detailed above, i.e. the number of registered unemployed has been decreasing following the introduction of the public work program in 2011. By all means, this trend is positive for the survival of the settlement, but it is unlikely that it could result in quality development.

However, the number of registered people does not reflect the actual unemployment situation, because there are those who work as casual workers or find employment in the "black economy". According to the Local Equal Chances Program, young people have a greater proportion in employment than the elderly. This is reflected in the relatively low figures of young job-seekers. Most of the registered unemployed people are not permanently unemployed, and this is also well reflected in rates comparable to national data.

One of the main reasons for unemployment is low education. According to district information, one third of the unemployed completed the eight grades of primary education, and nearly two thirds of them have secondary education. These rates are also reflected in the unemployment rate of the local population. The proportion of people with higher education in the settlement is high. However, programs to facilitate young people's employment and transition from education to the labour market are not available in the settlement. To use the various trainings and training courses for this purpose, one has to travel to Pécs. The employment office supports the unemployed to find jobs through training, and retraining programs, they assist new entrepreneurship and subsidize employment. (Local Program on Equal Chances 2013-2018) Based on the above, it can be established that the



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competitiveness of the settlement could improve through the improvement of the position of the population on the labour market.

#### 5. Opportunities of Competitive Advantage

#### 5.1. Tourism

Based on a more detailed economic analysis of tourism, it can be said that the performance of tourism is reflected in several sectors. However, its most direct relationship is with accommodation and catering industry providing 1.7% of GDP. The weight of this economic sector is obviously the largest in the counties around lake Balaton (3.0-3.9%) and in Heves county (2.5%). The number of guest nights spent at commercial accommodation increased dynamically between 2010 and 2015 nationwide. The main destination of tourism has not ceased to be Budapest and Lake Balaton, where 34 and 20% of tourist nights were spent respectively in 2015. The capital is highly attractive for foreign tourists Sixteen per cent of the guest nights spent by foreigners in the country can be linked to some commercial accommodation in Budapest. (CSO 2016b: 42)

#### 5.2. Culture as a cultural industry?

From a cultural point of view, the characteristics of the county - which, obviously, has a great impact on the position of tourism - can be regarded as uniquely developed. In addition to many other decisive factors, Pécs was the European Capital of Culture in 2010 and in 2007 Palkonya was the cultural village of Europe. There are appropriate infrastructure conditions available for pursuing cultural activities, but the utilization of cultural sites and monuments (such as the unique churches typical solely in the Ormánság region) is low. Active cultural life can generate demand for different areas and businesses of the cultural industry and creative industries. (Baranya County Regional Development Concept 2013)

The cultural and natural features of Baranya County are favourable for the development of tourism. In addition to the development of domestic, mainly wine



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and conference tourism, the structure of foreign guest turnover is also changing. According to the Regional Development Concept of Baranya County (2013: 62-63), Baranya's priority tourism product types include the following categories:

- Healing spa and thermal water tourism: Harkány, Sikonda, Magyarhertelend, Szigetvár, Siklós, Sellye, Abaliget
- Active tourism products: horse-riding tourism; water-sport tourism (Danube-Drava); Ecotourism: (territory of the Danube - Drava National Park); cycling tourism
- Wine tourism: Villány-Siklós Wine Route, Bóly-Mohács White-wine route, Pécs-Mecsek Wine Route
- Village tourism
- Cultural tourism: Pécs
- Conference and event tourism

From the point of view of tourism, Baranya is in line with the national trend, but some special areas boast different, very favourable indicators. They include, among others, the village of Abaliget, which is a favoured holiday resort. (Task Management, Institutional Network Operational and Public Education Development Plan 2013-2018: 14)

#### 5.3. Natural resources and potential

Considering the natural-geographic features of Abaliget found in the Pécs district as well as its immediate and wider environment, it is considered one of the most varied areas of the country, although it has a rather peripheral position in terms of geographical location. However, the region where the village of Abaliget is located is one of the most important tourist destinations in Baranya County. Its unique sub-Mediterranean climate and special architectural values, the cultural, sports and economic events (horse riding, fishing, golf, village, cultural and event tourism) it offers and nationality traditions explains the special role it plays in the region.



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Focusing on the town of Abaliget, according to data by TEIR, the number of guest nights per thousand inhabitants is high. Taking a closer look at the number of nights spent by guests on accommodation, the data of the settlement exceed both the national, regional, county and district averages over the 2004-2014 period. The most recent data for 2014 in Abaliget (5038 guest nights) is a downturn compared to the previous year, when there were 7489 guest nights. The 5038 guest nights spent on Abaliget are well above the national (2479 guest nights), the regional (2786 guest nights), the county (1708 guest nights) and the district (1571 guest nights) averages. (TEIR 2018)

Regarding the proportion of guest nights spent by foreign guests, however, the relevant data are far less favourable. Studying the proportion of nights spent by foreigners at the local accommodations, it is significantly below the national, regional, county and district averages. The proportion of foreign tourist in the gest nights spent in Abaliget has not reached 1% in several years: 2006 (0%), 2007 (0.1%) and in 2014 (0.67%).



Figure 2 F Proportion of guest nights spent by foreign guests (%) Source: TEIR – Helyzet-Tér-Kép, 2018

#### 5.4. Infrastructural developments



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I am convinced that the developments that are being implemented are the cornerstones of development, whereby the quality of public services available in the settlement have been improved. This also has an impact on the development of local tourism.

In the last decade, the local government has considered the improvement of environmental conditions as the most important task, including the almost complete development of the sewerage network, the development and expansion of the drinking water base, the improvement of the solid pavement of the internal roads, and the modernization of garbage transport and disposal.

Under the New Hungary Development Plan, within the confines of the construction DDOP-5.1.4 / A-09-2009-0015, the project of "Municipal Wastewater drainage network and Wastewater Treatment" was implemented between March 2010 and October 2012. As a result, the sewerage network of the settlement and the sewage treatment plant have been completely built. There is currently no piped gas network in the settlement. To wrap it up, the communal infrastructure of the settlement is adequate, the development of basic infrastructure is satisfactory.

Under KEOP-4.1.0/N/14 program, modernisation of energy management has been implemented in the public institutions of the settlement and solar panels have been installed, which, on the one hand, contribute to the use of sustainable energy use and, on the other, provide a positive model for the population.

In Abaliget, the South Transdanubian Operational Program DDOP-2.1.1/A.B-12 "For the Development of Tourist Attractions and Services in Convergence Regions" was implemented earlier. The aim of the development was to exploit the natural assets of Abaliget, the fascinating beauty of the surrounding landscape and the peaceful rural environment and high-quality air, to create a tourist attraction that greatly contributes to the diversification of the domestic ecotourism supply.

#### 5.5. Opportunities in Health tourism



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There is only one medicinal cave in Baranya County and Pécs district, and it is found in Abaliget. It has a so called "healing room", and these caves have a unique climate that has a very positive and beneficial effect on the symptoms of allergic diseases. In its decision of 5 September 2000, based on Decree 74/1999 (XII.25) by the Ministry of Health, the National Agency for Medicinal places and Medical Spas of the National Public Health and Medical Officer's Service, classified the so-called physiotherapy section of the highly protected cave as a medicinal cave.

The Abaliget cave can affect the prognosis of individual diseases not only locally but also at regional level. In the long run, it can improve the quality of life of patients, contribute to their more active participation in society and increase the number of years spent in health. There is no similar natural heritage in the county and throughout the Southern Transdanubia region, which would also be suitable for medical purposes.

I am convinced that unique features and special local characteristics are capable of creating the potential competitive factors whereby stable, sustainable growth and development can be achieved. In the case of Abaliget and the region under study, this is clearly to be found in health and other nature-related touristic potential.

#### 6. Conclusion

In my opinion, although it should be modified at several spots, the Porter diamond model can be used to describe the competitiveness of a settlement. The value of the model is primarily found in the analysis of the various factors separately, and then their interaction in the system with one another.

Based on Abaliget's characteristics, areas of development primarily include health tourism, fishing and cycling tourism, ecotourism and as new ideas for both territorial and infrastructural development options, conference and event tourism can be adapted to the county's characteristics and economic development priorities.

With the development of local tourism, it is possible to increase the number of accommodation in the country, and thus to boost local tourism and catering



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industry. The development of domestic and foreign tourism may offer opportunities to villages to break out. In summary, it can be said that the striving of health tourism offers a great potential for Abaliget. The exploitation of the rare natural treasures will have national prospects, and in addition to mass tourism, the village of Abaliget may develop into a health-tourism centre as well as a destination for ecological and fishing tourism, possibly coupled with event and conference tourism.

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## Impact of Globalization Tendencies and Competitiveness Factors on Operating Surplus of Enterprises in Various Region Types

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#### Abstract

Within European Union's internal regional structure, there are still some regional disparities due to the geographical location and economic characteristics of the regions, which to a certain extent determines some specific factors of their competitiveness, respectively competitiveness of regionally-established enterprises. That does ultimately reflect on the impact of globalization in the region. In the context of this paper, we deal with the impact of regions geographical location, which we categorize into four categories based on their geographic and economic characteristics (urban regions, rural regions, mountain regions, border regions) and the impact of resulting regional disparities to the competitiveness of enterprises in the given regions, within selected countries of the European Union. In this context, the term region is to be understood as the corresponding regional equivalent of the nomenclature unit of the European Union Territorial Statistics (NUTS) at level three. Our contribution aims at determining and characterizing the influence of selected factors of competitiveness and globalization trends, which at a different point of view could also be also perceived as regional disparities (such as GDP per capita, investment volume directed into the region or household consumption in the region), the competitiveness of regionally established businesses, depending on the specific type of the region. Impact intensity of selected indicators was determined by generalized linear models (GLM) based on the assumptions of evaluated data. This contribution was created as part of the VEGA grant scheme, project number 1/0578/18 "Modification of Methodologies for Sustainable Development Assessment and Management". Also, the project of the KEGA grant scheme of the Ministry of Education, namely Project 038PU-4/2018 "Development of the study programme Environmental Management in second level of study".

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#### JEL Classification: R11, O12, D24

#### 1. Introduction

Economic differences can be perceived in various levels of regional development (Matlovič and Matlovičová, 2011). Regions in countries of European Union currently have a different degree of economic and social development and growth. Regional disparities and differences are revealing not only between EU countries, but also within regions of a particular country. We specifically are dealing with selected factors of globalization and competitiveness that influence operating surplus of enterprises on a regional level, within NUTS 3 geocode regional standard of the European Union. We believe that impact of factors such as GDP per capita, import and export, gross fixed capital formation, inflation, employment and compensation of employees and taxation of products may vary in different types of regions. We considered theories of growth, as aggregate product is a sum of total production of companies at a certain price level, which also determines the operational surplus of the enterprises. This was based on the revised Mankiw, Romer, and Weil's (1992) classic empirical study of the Solow (1956) model of economic growth or Bernanke and Gürkaynak's study (2002). This has highlighted the importance of using the GDP per capita indicator and labour market indicators, employment and compensation of employees (Gollin, 2002), where productivity is performance measure that contains everything what makes enterprise function better. Also, in accordance with Hecksher-Ohlin models, expanding trade will reduce demand for scarce factors of production (labour) while increasing demand for capital-intensive production (Wood, 1994).

Investments are usually connected with two main types of effects which are income effect and capacity building effect. The capacity building effect of investments means that new investment creates new production capacities which then increases



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the accumulation of capital, level of potential product and economic growth. Income effect basically accelerates consumption and thus growth of GDP, which is related to the fact that new investments tend to create new jobs thus increasing the aggregate demand (Lisý, 2011). One of the direct effects of these new capacities to economic development is the evolution of newcomers. But they also represent extended pressure of competitiveness for already established market players, which can result in crowding out (Fritch and Mueller, 2004). In case in which only a part of relevant markets is covered by a certain analyzed region, the analysis can indicate number of relevant differences. Origin of these differences can be connected to dissimilar quality of start-ups in various regions, which affects their succession rate that is affecting effects of direct employment thus varying considerably. The strength of these effects is influenced by the amount of high quality start-ups and presence of relevant resources allocated in the respective region. One of the effects connected to region-specific characteristics in case of regions with low level of productivity can be decline of employment due to displacement effects. Aforementioned crowding-out effect can have cross-regional infliction, meaning start-ups in one region can crowd out businesses in connected regions. The same applies for supply-side effects (Fritch, 2017).

The NUTS (Nomenclature of Territorial Units for Statistics) regions system may be described as a hierarchical system used by Eurostat for dividing up the territory of the EU for the collection, development and harmonization of European regional statistics. In our study we focus on NUTS 3 regional level which involve smaller regions for specific diagnoses. The population of the NUTS 3 regions is within the range of 150 and 800 thousand (Vandermotten and Van Hamme, 2017).



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As to categorize the regions by their geo-economical character we're strictly following the methodology of Eurostat which defines them as follows (Dijkstra and Poelman, 2018):

- The urban-rural including remoteness typology classifies all NUTS-3 regions according to criteria based on population density and population distribution (urban-rural).
- Border regions: The NUTS-3-based selection of border regions refers to the regions participating in the core areas of cross-border cooperation programs in the programming period 2007-2013.
- Mountain regions at NUTS-3 level are defined as regions in which more than 50% of the surface is covered by (or more than 50% of the regional population lives in) topographic mountain areas.

Globalization may also be one of the factors which's impact vary given a specific type of region. The origins of globalization are related to the regional diversification of resources. Geographical discoveries, population mobility increase, industrial and technological development and innovations that were very important in this area. (Impacts of globalization are to be perceived on regional level with more intensity than on national level.) Therefore, the globalization is primarily an effect of changes in the economy and it contributes to searching for newer sources of competitive advantage. The result of the globalization is the intensification of competition, both on national and international markets (Skawińska, 2011). It is also the reason why the enterprises have to cope with new requirements and challenges (Gorzelany-Dziadkowiec, 2013). Regarding enterprises, competitiveness is related with potential, resources, skills, abilities which are the factors that ensure an advantage over other companies operating in a particular country, region or sector (Walczak, 2010).



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#### 2. Methodology

The main objective of the paper can be considered to quantification of differences between the impacts of selected set of indicators representing competitiveness factors and globalization tendencies on the formation of operating surplus of enterprises within regions categorized according to geographic and demographic characteristics. We will also consider the impact of the labor market (employment in a given type of region and compensation of employees), internal market characteristics (aggregate per capita production, household consumption and inflation), innovation trends (gross fixed capital formation) and foreign trade balance export and import).

In terms of main objective, we construct following hypothesis:

- 1. The strongest positive effect of household consumption can be found in rural region type.
- 2. There is significant dependency of enterprises operative surplus on gross fixed capital formation.
- 3. The export and the import have strongest effect in border regions.
- 4. The compensation of employees brings strongest effect in urban regions.

Used longitudinal data consists of 15 cross-sectional units tracked over 5 years, namely in 2011-2015. We have included several European countries<sup>5</sup>, while the criterion for country selection was the availability of the necessary data. The total database contained 75 observations for each model, after omissions of the data were data not related to operating surpluses of enterprises in each region were outselected, the dataset narrowed to 66 observations for models 1 (urban regions), 2 (rural regions) and 4 (border regions) respectively, 47 observations for model 3 (mountain regions). After omission of missing dependent data variables, they consisted of 65 observations for models 1, 2 and 4, respectively. 46 observations

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for model 4. Source of the collected data was the Eurostat database. For data processing, program R (version 3.4.3) with RStudio (RStudio 1.1.442) was used. The summary of variables used in the impact assessment of the selected set of indicators is presented in Table 1.

Table 1 List of variables used in models

Variable	Description	Usage			
	Operating Surplus of Enterprises in Urban Regions [percentage]. The variable				
OSoEiUR	captures the ratio of the operating surplus of companies in urban areas to the total				
	operating surplus of all enterprises in given country. (dependent variable)				
	Operating Surplus of Enterprises in Rural Regions [percentage]. The variable				
OSoEiRR	describes the share of operational surplus in rural areas and the aggregate operating				
	surplus within the country under consideration. (dependent variable)				
	Operating Surplus of Enterprises in Mountains Regions [percentage]. The variable				
OSoEiMR	expresses the percentage of operating surplus of mountain regions to the total				
	operating surplus recorded in given country. (dependent variable)				
	Operating Surplus of Enterprises in Border Regions [percentage]. The variable is				
<b>OSoEiBR</b>	characterized by operating surplus of enterprises in border regions, which is divided	Model 4			
	by the total operating surplus in given country (dependent variable)				
	Employment in Urban Regions [percentage] The variable is defined as the share of				
<i>FiUR</i>	employment in urban areas and total employment in given country (control /	Model 1			
2.010	independent variable)	inouch i			
	Employment in Rural Regions [percentage] The variable is characterized as the				
FiRR	percentage of the number of people employed in rural areas and the total number of	Model 2			
	neonle employed in given country (control / independent variable)	model 2			
	Employment in Mountains Regions [nercentage]. The variable captures the ratio of	the ratio of			
FiMR	employment in mountain regions and total employment in given country (control)	Model 3			
Linn	independent variable)	widder 5			
	Employment in Border Regions [percentage]. The variable describes the share of				
FiRR	employment in frontier areas to total employment in given country (control)	Model 4			
Libit	independent variable)				
	Gross Domostia Broduct per capita [no unit]. The variable is the value of the country's				
GDPpc	gross aggregated output per capita (control / independent variable)	All Models			
	Consumption of Households [percentage]. The variable is expressed as the ratio of				
CoH	household consumption to the total GDP of given country (independent variable)	All Models			
	Gross Fixed Capital Formation [paraantaga]. The variable is defined by the ratio of	-			
CECE	cross fixed capital formation (percentage). The variable is defined by the fatto of	All Models			
GrUr	gross fixed capital formation (perceived as total foreign and domestic investment) to total aggregate production of given country (independent variable)	All Woulds			
	Export (paraantaga). The variable characterizes the ratio of the export of goods and				
Ex	export [percentage]. The variable characterizes the ratio of the export of goods and services to given country's total GDP (independent variable)	All Models			
	Import (noncontage). The variable conturns the chara of imports of acade and convices				
Im	import (percentage). The variable captures the share of imports of goods and services				
	and the aggregate production of given country. (independent variable)				
HICP	inflation [percentage]. The variable records the evolution of the HICP (perceived as	All Models			
	initiation) values expressed in relation to the base year 2015. (Independent variable)				
	Compensation of Employees [percentage]. The variable expresses the proportion of				
CoE	employee compensation including an costs associated with the employment of a				
	person (including contributions to the Social and Health Fund) to the level of				
1	aggregate revenue recorded by enterprises in given year. (independent variable)	1			



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Variable	Description	Usage
PT	Products / Production taxes [percentage]. Variable represents the sum of all types of taxes charged for the production (and consumption) of products paid by enterprises respectively. enterprises and residents (excluded import taxes) to the total revenue of enterprises. (independent variable)	All Models

Source: Eurostat

Generalized linear models (Nelder and Wedderburn, 1972) are an extension of linear modeling processes, thus extending regression analysis. These models can also be applied to data that do not meet the assumption of normal distribution, depending on the model's pattern. Within the model, we considered Gamma distribution of standard errors structure and we use inverse link function. The use of more complex linking functions did not lead to better results. The GLM model uses algorithm of model's maximum likelihood, with the goodness-of-fit statistic derived from log-likelihood ratio, which is called deviance.

#### 3. Analysis and results

Based on the results of evaluation of presence of normal distribution for all variables used by the Kolmogorov–Smirnov test, respectively Shapiro-Wilk test (for model 3) we were unable to use regression models, which was the reason for the use of generalized linear models under the assumption of Gamma distribution of standard errors using inverse linkage function. The transcript of the model can be written as:

$$OSiSR_{ct} = \beta_0 + \beta_1 EiSR_{ct} + \beta_2 GDPpc_{ct} + \beta_3 CoH_{ct} + \beta_4 GFCF_{ct} + \beta_5 Ex_{ct} + \beta_6 Im_{ct} + \beta_7 HICP_{ct} + \beta_8 CoE_{ct} + \beta_9 PT_{ct} + \varepsilon$$

where c index represents the cross-sectional area (country), t index represents the time dimension, OSiSR is understood as the operating profit of enterprises in the selected region type, EiSR then records the people employed in these regions, GDPpc represents the level of aggregate per capita production, CoH records the consumption of households, the GFCF variable is defined by the volume of investments (or gross fixed capital formation). Ex represents the country's exports at a given time, Im is then the amount of imports, HICP is the rate of inflation (or the harmonized index of consumer prices), CoE expresses the cost of employment



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(including contributions to the social and health fund) and the PT predictor records the revenue of the state from taxes levied on production (taxes and import duties excluded). After the model was assembled, the heteroskedasticity of the residues was tested which resulted in no homoskedasticity detected. The summary of results is in Table 2.

		Model 1	Model 2	Model 3	Model 4
		OSoEiUR	OSoEiRR	OSoEiMR	OSoEiBR
(Intercept)	Estimate	-26,55229	-118,27217	-24,08291	-11,39549
	SE	17,22081	42,82746	8,69465	7,21973
	p-value	[0,12310]	[0,00575] ***	[0,00561] ***	[0,11448]
EiUR	Estimate	-28,76634			
	SE	3,11799			
	p-value	[< 2,2e-16] ***			
EiRR	Estimate		-87,81213		
	SE		18,88959		
	p-value		[3,34e-06] ***		
EiMR	Estimate			-20,97141	
	SE			1,04211	
	p-value			[< 2,2e-16] ***	
EiBR	Estimate				-7,92804
	SE				0,51625
	p-value				[< 2e-16] ***
GDPpc	Estimate	1,40256	7,10211	1,41120	1,84768
	SE	1,25305	3,40376	0,47162	0,56295
	p-value	[0,26300]	[0,03693] **	[0,00277] ***	[0,00103] ***
СоН	Estimate	26,46641	89,45147	19,50103	10,02728
	SE	10,39187	30,24286	6,58645	5,18666
	p-value	[0,01087] **	[0,00310] ***	[0,00307] ***	[0,05320] *
GFCF	Estimate	36,33983	72,19946	31,03129	8,37423
	SE	10,97802	43,98803	6,30430	4,58304
	p-value	[0,00093] ***	[0,10073]	[8,556e-07] ***	[0,07300] *
Ex	Estimate	23,97740	99,34710	27,85071	4,59711
	SE	8,70555	29,74053	6,31034	3,86088
	p-value	[0,00588] ***	[0,00084] ***	[1,017e-05] ***	[0,23378]
Im	Estimate	-21,49230	-89,85498	-23,42310	-6,42118
	SE	8,15909	29,12836	6,08869	3,60038
	p-value	[0,00843] ***	[0,00204] ***	[0,00012] ***	[0,07451] *
HICP	Estimate	0,01947	0,25055	-0,00540	0,02319
	SE	0,06813	0,11146	0,02703	0,02548
	p-value	[0,77501]	[0,02459] **	[0,84155]	[0,36291]
CoE	Estimate	2,07974	3,49285	2,14814	-0,04883
	SE	0,86728	1,52185	0,36004	0,51645
	p-value	[0,01648] **	[0,02173] **	[2,427e-09] ***	[0,92467]
РТ	Estimate	-1.50052	-2.81735	9,72169	-2.83264

Table 2	GLM in	nnact models	s of c	nerating	surnluses	of	enternrises
I able 2	GLM III	iipaci moueis	) UI (	per ating	sui piuses	UI.	chiel prises



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		Model 1	Model 2	Model 3	Model 4
		OSoEiUR	OSoEiRR	OSoEiMR	OSoEiBR
	SE	1,86629	7,78674	0,88572	1,42690
	p-value	[0,42139]	[0,71749]	[< 2,2e-16] ***	[0,04713] **
AIC		-152,47	-148,56	-208,68	-199,74

Source: Own construction based on Eurostat data

The first of evaluated predictors, which are individual for each of the models, can be characterized as the number of employees employed by enterprises in the chosen region, gradually recording employment in regions with majority of urban population, employment in regions with predominantly rural population as well as employment in mountain regions and regions in border areas. It should be added that we considered this variable as of control character. The analysis has shown that there is an indirectly related relationship between the relative indicator of corporate profitability and employment in the regions concerned. This situation results from the fact that wage costs are one of primary segments of company's total costs. However, an increase in the labour factor should also lead to an increase in production of the company. As a result, employee productivity is growing slower than wage increases, which seeks to reduce corporate profitability and gradually weaken the competitiveness of the regions as well as observed EU countries. This is related to the employment factor (beyond the full employment of the region), which was more pronounced in observed period of "crisis". The most pronounced impact of employment was recorded in rural areas, mainly due to the fact that in these regions, was observed significantly lower proportion state of population's employment, than in the other types of regions. Among the other regions (where the indicator was at an almost identical level), this factor has reached the most intense impact in urban areas. Since these locations have the highest utilization of labour factor, any increase in employment brings the highest rate of expected reduction in operating surplus. This independent variable has the lowest impact in peripheral regions where labour market pressure is the weakest. This relates to the fact that most countries concentrate infrastructure, investments (and any additional resources) within inner regions, while the border region is mostly suffering from a lack of resources. For mountain areas, the impact of this factor is somewhat lower



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than in the case of cities, but much higher than in peripheral regions. This is related to the fact that, in most of the countries selected, this type of region is linked to tourism and thus to the development of these regions and a higher level of employment.

Next and also the last control variable is the logarithm of aggregate production of the country, expressed per capita. This factor achieved in all significant cases expected direct relationship as it can be perceived as an indicator of state of the economy. The lack of statistical significance of this predictor in case of urban regions results from the fact that in cities, urban agglomerations are concentrated in multinational enterprises, but also companies are able to compete on foreign markets. These firms are therefore not so dependent on the development of the domestic economy and their production is oriented towards foreign markets, which also affect the level of their operating surplus. Opposite phenomenon appears in businesses in rural areas. For these regions, the state of the economy is most pronounced, which relates to the primary orientation of enterprises on the domestic market. This factor could have been of even higher level if we were to discard agrarian enterprises whose products, also reach different markets, so demand for their products does not develop at the same time as GDP. In addition, food as such is an indispensable part of daily consumption, and so the state of the economy does not affect its demand curve. The only factor with which we could consider agrarian companies is a more substantial fluctuation in their prices, which would lead to preference for products from other countries, and additionally their production is affected by the weather. In the mountain regions, the state of the economy has the least impact, as these regions orient mostly on tourism in most of surveyed countries and depend only to a certain extend on the country's economic cycle. Attractiveness has greater impact on demand after the services, or from the point of view of region's natural wealth (Protected Landscape Area's, national park's, etc.) that attracts potential customers from other countries. In the case of border regions, the impact of this factor is somewhat higher than in the case of mountain regions, as in their



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case, foreign demand (from a nearby area located in another country) has not so much effect.

Another variable included in our assembled model was the ratio of household consumption to the size of its aggregate production. Even in this case, there was a directly proportional relationship for each model resulting from higher level of demand. It either stimulated businesses to increase production, or influenced price level of products, depending on optimization of business profits. As expected, the highest intensity of impact has been determined in enterprises established in rural areas where is the highest degree of interconnectivity with purchasing power of population, so we fail to reject 1<sup>st</sup> hypothesis. These businesses are primarily targeted at local customers, and any changes in their consumption preference will affect these businesses more significantly. The second most intense impact has been recorded in urban regions, where is a relatively large group of multinationals and companies concentrating a large part of production on foreign markets, but also enterprises that concentrate their production on local (in the given economy) markets. There is also a sufficient number of retailers and wholesalers to whom this factor has a significant impact, which eventually intensifies the impact within this region. The results of the other two models have shown that this impact is weakening in cases of border and mountain regions. Penetration into the foreign market within border regions, is simple (given that all countries are members of the EU) and that part of the supply in the region is confronted with demand for the border region of another country. However, in this case, it is clear that the pressure of foreign competition, which relatively easily penetrates into the domestic market, is also increasing. On basis of the aforementioned fact, the lowest intensity of household consumption is in the vicinity of the border. For mountain regions, this phenomenon is linked to the fact that a significant part of customers come from other countries, and the changes in the ability of domestic population to affect the purchasing power of local population then affect only a particular segment.



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As part of our analysis, we also included the gross fixed capital formation predictor, which we considered a domestic investment by companies to improve their position on the market. The impact of this predictor itemize a direct relationship for all relevant options, where the statistical significance was not confirmed in the model predicting the proportional level of the operational surplus of the rural regions. This is related to low rates of investment trends of companies in the given areas resulting from the primary concentration on the local market. The primary competitive advantage of these businesses is their location where most of their customers favour given entities based on proximity rather than features of their products. This market is largely saturated and investment tendencies are not likely to attract additional customers, their sole effect is to increase productivity. This situation is mainly related to non-agrarian subjects in rural areas. In the case of agrarian holdings, innovative tendencies are mainly linked to the different forms of structural funds. The market is, in addition significantly undermined by state and European Union subsidies. However, he subsidies are primarily intended to increase the competitiveness of European food products (a slight increase in the operating surplus of the enterprises concerned) and to preserve the EU's food self-sufficiency, thus disrupting market conditions is not the objective, only an additional impact. A similar situation (in case of non-affiliated enterprises) also applies to border regions, where additional investments only lead to marginal growth in companies' profits, as the competitive advantage of these companies is mainly their location and the potential of reaching new customers abroad. Considering mountain regions, relatively strong impact of this factor is linked to the fact that long-term assets investments tend to lead to an increase in perceived quality of products (especially services related to tourism) or the range of products offered and consequently a greater influx of customers. For businesses in urban areas, investment is linked to streamlining processes, but also improving the end product. And whereas a substantial part of the enterprises in these areas are also concentrated on foreign markets, the factor has had the most significant impact in this type of regions. And therefore we fail to reject  $2^{nd}$  hypothesis.



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We've also taken into consideration the impact of import and export. We treated export as a representation of expected increase in operating surplus of enterprises in the region in all models. Import, on the other hand, was a reduction in the expected proportional operating profit of businesses. This apparent state of affairs is, of course, related to the ability of enterprises to penetrate other markets, thereby increasing their output and profitability (resulting from scale yields), creating a growing competitive pressure on the market. The most striking finding of regarding trade balance indicators of countries is their most intense impact within the regions with primary rural settlements. This finding is related to the fact that in the case of those companies operating on a relatively saturated market, where the increase in market share played a challenging role due to strong competition, has this situation led to a fact that any possibility of increasing the sales of company's products has enormously increased the production and thus profitability as well. Conversely, in the event of additional pressure occurrence on the local market, due to the arrival of foreign competitors, these companies were less able to maintain their market share. Note that these factors further exacerbate the situation for agrarian enterprises as aforementioned. The second most intense impact was observed in mountain region businesses. This phenomenon is primarily related to larger consortia in the tourism sector, which by penetration to other markets significantly influenced the balance of that market. This concludes that any increase in exports brings a relatively strong increase in expected operating surplus of such companies. However, in case of higher import rates, a more significant decrease in their profitability is expected. In addition to the two above mentioned regions, also urban areas show positive trade balance. This fact is related to the postulates we have mentioned above. Thus these regions have a relatively high proportion of enterprises that concentrate production at least in part on export. However, the result of the fourth model set (excclusively), predicts a negative impact of the trade balance on profitability of the region. The statistical significance of country's export to GDP ratio was proven statistically insignificant, so we reject 3<sup>rd</sup> hypothesis. But this phenomenon is based on the fact that businesses in the regions (except for export-oriented) do not have to develop



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pro-export activities, as a part of the foreign market segment has direct access to the market, therefore depends on customer preferences and their willingness to buy products on a relatively near market of neighbouring country. Importance to these regions has shown statistical significance at 10% rate. The low intensity of this factor is also related to a similar position to that outlined in the case of export.

We've also taken into account the impact of inflation, namely the HICP, for two reasons. The first was that higher consumer price reduces the competitiveness of products when compared on international level. The second reason was the fact that while wages work on the contraction principle (and thus change in leap), product prices fluctuate continuously. This phenomenon, together with better information for businesses, contributes to the transfer of capital (for the benefit of enterprises, i.e. higher profitability). However, findings from models assembled shows the presence of statistical significance only in case of regions with significant rural settlements. This points to the fact that during the period under review and in the economies in question, the first of the effects considered i.e. the change in the competitiveness of products on other markets as a result of changes in inflation, does not play a relevant role (due to the nature of products on export) and with inflation we can consider only on the basis of the redistribution of capital within the economy, which contributes to raising the proportional level of operating profits. The absence of factors of such importance in other models is linked to the higher concentration of export regions (compared to rural regions).

Compensation of employees with all kinds of expenditures (wages, tax contribution to the social and health fund, etc.), regarding factors of labour market, associated with employment of the labour force, respectively with the ratio of compensation to the company's returns is also factor to be considered. Within all significant input variables in the assembled model, a direct relationship was recorded. Nature of this relationship, proven by modelled test, has been slightly surprising regarding to the two correlations. The first is that a crisis period associates with the period of economic growth on the scale of all elected countries, and the growth of companies'



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incomes as well. The second correlation follows the first, which, under certain conditions, contributes to bringing the labour market to a position of full employment, the second fact is that higher overall compensation rate is related to the gradual increase of wage requirements resulting from the social policy of the state (increase in minimum wages and levies), but also with the increase of employees. With higher incomes, their consumption levels (also regarding the trend to increase consumption) and higher utilization of production factors, enterprises generate higher production volumes, thus increasing operating surplus through economies of scale. This phenomenon was most significant in rural areas, which is linked to the growth in consumption (on which these regions depend heavily), and the rise in wage costs was largely linked to more developed regions. The second phenomenon, coupled with higher production and growth in labour efficiency (also production), on the basis of staff growth, has had a significant impact on urban and mountain regions. Regarding results, described above, we reject 4<sup>th</sup> hypothesis.

The last of factors implemented in our models are taxes on production (excise taxes, VAT and income tax), but we did not consider taxes and duties imposed on imports respectively their ratio to operating surplus. This was the tax paid by domestic producers, which had a statistically significant impact only in mountain and border regions. The absence of significance for urban and rural regions is linked to a proportional increase in income (or operating surplus) and taxes levied on domestic producers in these areas. For mountain regions, the relationship between the chosen factor and the predicted variable was directly proportional. On the contrary, in border regions, we have to consider the tax factor to be a negative one, because taxes paid by subjects from these regions grew faster than the operating surplus of regionally established companies. Based on the relative quality of each model against the other assembled models using the Akaike information criterion, with the mountain regions proven as to be the most accurate.



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#### 4. Conclusion

Based on the above-mentioned results of analysis, it can be stated that in order to achieve the objective of our contribution we identified the following:

For urban regions, employment factor was the second most significant among the types of regions surveyed, because in these localities, labor productivity is most pronounced, any increase in employment brings the highest rate of expected reduction in operating surplus. On the other hand, the aggregate output (per capita) logarithm for the urban regions has proved to be statistically insignificant, attributing to increased concentration of multinationals competing in international markets, which, due to this type of competitiveness, is not directly dependent on the domestic or host market. Ratio of household consumption to the size of aggregate production was the second most significant in the given type of region, which we see as a consequence of part of allocated enterprises, in the current coexistence with multinationals concentrating on the local market (in given economy). The gross fixed capital formation factor was most pronounced in the case of urban regions, as a substantial part of the enterprises in these areas, also concentrated on foreign markets. A direct result of this fact is also positive result of foreign trade balance indicator. Increased productivity and work efficiency were positively reflected in the employee compensation factor. Impact of inflation and corporate taxes, which is related to the proportional increase in income (or operating surplus) and taxes levied on domestic producers, was also insignificant.

Rural areas are characterized by the greatest impact of employment, which, in our opinion, is due to its significantly lower proportional character, other types of regions compared. The logarithm of aggregate production per capita is very pronounced in rural areas, which relates to their orientation on domestic market. We assume that possible dismantling of agrarian enterprises from the analysis would increase the significance of this factor as their production reaches different markets, which means that the demand for them does not develop simultaneously with the GDP. The impact of household consumption ratio on the size of aggregate



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production has also proved to be significant as well as the impact of inflation represented by the harmonized index of consumer prices due to the high degree of interconnectivity with the purchasing power of the population. The most surprising result is the highest significance of the rural type of region in the case of foreign trade balance factor, which shows that any possibility of increasing the sales of products enormously increased the production of enterprises, consequently their profitability. Conversely, if additional pressure on the local market is to occur due to the arrival of foreign competitors, these companies would be less able to maintain their market share. On the contrary, gross fixed capital formation and taxes levied on production statistical significance is not confirmed for this type of region. Regarding taxes on production, we explain the result in the same way as for urban regions.

Mountain regions have lower impact of employment than in urban areas, but higher than in peripheral regions, which relates to tourism and hence to development and higher employment rates in these areas. Factor of aggregate (per capita) logarithm has the least impact on mountain regions, which is again related to tourism orientation, thus a lesser degree of dependence on the economic cycle of the country. The county's proportion of household consumption to the size of its aggregate production is weakened for this type of region compared to the first two types, which is associated with large proportion of customers coming from other countries, and changes in the capacity of the domestic population then affect only a particular segment. The gross fixed capital formation factor has a relatively strong impact in mountain regions, which is linked to the fact that investments in fixed assets lead to an increase in perceived quality or range of products offered, especially in the tourism sector, which is associated with a higher inflow of customers. The impact of foreign trade balance of the country in the given type of region has proved to be the second most intensive among types of regions studied, which primarily relates to larger consortia in the tourism sector, which increase market penetration into other markets more significantly. The impact of inflation is not statistically significant. Employee compensation factor was associated with



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higher production and growth of work efficiency, and in mountain regions it had a significant impact. In case of production taxes, in these regions the investigated relationship was shown to be directly proportional, i. e. the taxes grew more slowly than the operating surplus of enterprises, indicating increased opportunities for tax optimization of enterprises (the tourism sector) in increased production.

In border regions, the employment impact variable is the lowest, as there is the weakest labor market pressure. The reason is that most countries concentrate resources mainly within other regions. In the case of border regions, impact of the aggregated production of per capita logarithm of the country is slightly higher than in the case of mountain regions, as foreign demand (from a nearby area located in another country) does not have such an impact. In border regions, in the context of ratio of household consumption to the size of its aggregate production it is clear that the pressure of foreign competition is increasing in these regions, resulting in decrease of household consumption intensity in the vicinity of the border. In border regions regarding gross fixed capital formation, additional investments only lead to marginal growth in companies' profits, as the competitive advantage of these companies is mainly their location and their ability to reach potential customers abroad. The impact of country's foreign trade balance in border regions related to profitability has not shown statistical significance, exclusively among the types of regions. It could be the case that businesses in the region do not have to develop pro-export and import activities as part of the foreign market segment, have direct access to the market, and therefore the aspect depends on customer preferences and their willingness to buy products in a relatively near market in the neighboring country. The impact of inflation and compensation of employees for border regions is also not statistically significant. The last factor under consideration was taxes on production, which had a statistically significant impact in the given type of region. However, we have to consider the tax factor here in a negative way, taxes paid by subjects from the regions grew faster than the operating surplus of companies.



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# Smart City Solutions in the Capitals of the EU Countries

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#### Abstract

Innovative technologies are increasingly important in the development of cities, regardless of whether they are used by local governments or the private sector. Innovations are emerging in more and more areas that contribute more to efficient and sustainable cities, improving the quality of life of the locals. As the volume of available data is constantly increasing, new technologies and a different way of thinking are needed. In addition to technology, there is a need for city dwellers or the active participation of NGOs. In the first part of our study we will review the definitions of the smart city with the help of Hungarian and international literature. We will then examine the level of capital cities of the European Union for the achievement of smart urban programs. We summarize what kind of improvements are being implemented today and what improvements are expected in the future in the cities examined. We also strive to show projects that are less suited to current trends but they may be worthy of wider audience due to their innovative nature.

Keywords: Smart City, EU Capital Cities, Projects, Trends, Innovation.

#### JEL Classification Codes: O18, O31, Q55, R12

#### 1. Introduction

The development of cities increasingly requires the use of advanced technologies, with particular attention to the wider range of tasks to be solved. In developing countries, the problems identified by the rapidly growing population are dominant, while in developed countries with mostly aging populations focus more on improving the quality of life, reducing social inequalities and developing sustainable structures.

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Smaller, medium-sized cities are characterized by system-oriented solutions, thanks to the fact that the costs of introducing new systems in the case of large settlements can be extremely significant thanks to their complexity. Literature is mostly concerned with the best practices of medium-sized cities, while big cities, besides the various ranking lists are compared and evaluated rarely. Therefore, in view of the shortcomings of the literature available to us, in our study we are attempting to demonstrate the achievements of the smart city in view of the European Union's capital cities.

## 2. Literature review

Since the development of the industrial revolution, specialists of development of cities have been visioning the most advanced technologies in their ideas. Centuries earlier, the innovative solutions were driven primarily by the development of mechanical machines, but in recent decades, the development of electronics has been the most important driving force (Péter, 2017).

After the Second World War, the futuristic ideas were replaced by the aspirations to improve the quality of life and human life. Thanks to the development of telecommunications in the 1960s the first similar concept which was developed 'electronic urbanization' (Zenetos, 1969).

Subsequently, the terms 'cybercity', 'information city' or 'digital city' were introduced in the literature of town development (Batty, 2012).

Clearly one of the most important urban's phenomenon is the integration of settlements and digital technologies in the 21st century (Rab, *et al.*, 2015). The growth of smart city initiatives is continuous, cities are trying to solve complex problems, while increasingly elaborated processes need to be treated simultaneously (Nagy, *et al.*, 2016).

The spread of smart technologies improves the quality of life, can contribute to reducing territorial differences within settlements, improves accessibility of urban



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services, reduces the burden on environment, and contributes to improving the situation of disadvantaged groups.

Smart city is a relatively new topic in science, the first such terms were used only in the 80s and 90s in the literature. Although the expression 'smart city' is becoming more widely known - thanks to the rapid development of ICT - there is no commonly agreed definition or concept of its content. In the last few years, more and more similar expressions have been spread about cities, for example: intelligent city, digital city, sustainable city, knowledge city ... etc., but the smart city term is still the most well-known. (Nagy, *et al.*, 2016)

People in smart cities are basically coming from three areas (developers of technology infrastructures, environmentalists, and social scientists), while the smart city concept has developed primarily on four levels (academic, corporate, government and media) (Péter, 2017).



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'okos város'	127,000	88.82	82	47.40	'smart city'	54,600,000	6.41	2,480,000	12.18
'intelligens város'	7000	4.90	26	15.03	'intelligent city'	64,800,000	7.61	2,650,000	13.01
'tudás város'	1100	0.77	2	1.16	'knowledge city'	147,000,000	17.26	4,530,000	22.25
'fenntartható város'	3270	2.29	41	23.70	'sustainabl e city'	3,320,000	0.39	2,360,000	11.59
'tehetséges város'	414	0.29	0	0.00	'talented city'	76,100,000	8.94	338,000	1.66
'összekapcsolt város'	230	0.16	1	0.58	'wired city'	27,700,000	3.25	305,000	1.50
'digitális város'	3780	2.64	14	8.09	'digital city'	335,000,000	39.34	3,020,000	14.83
'információs város'	196	0.14	7	4.05	'informatio n city'	143,000,000	16.79	4,680,000	22.98
összesen	142 990	100	173	100	sum	851 520 000	100	20,363,000	100

Table 1 Frequency of mentioning 'Smart City' and similar expression in English and Hungarian

Source: Own compilation

We wondered if the smart city phrase was still the most widely used, so we did a search in Hungarian and English with google search engine and google scholar. In the case of Hungarian search, it is still the most widely used, but in English the search engine has found more hits for new terms.

A wide variety of definitions has been established in recent years in connection with the smart city, and we would like to quote some of these.

- 'a Smart City is a city well performing built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens' (Giffinger et. al 2007),
- 'smart city is defined by IBM as the use of information and communication technology to sense, analyze and integrate the key information of core systems in running cities' (IBM, 2010),



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- 'a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance' (Caragliu et al., 2011),
- 'a smart community is a community that has made a conscious effort to use information technology to transform life and work within its region in significant and fundamental rather than incremental ways' (California Institute, 2001),
- 'Concept of a Smart City where citizens, objects, utilities, etc., connect in a seamless manner using ubiquitous technologies, so as to significantly enhance the living experience in 21st century urban environments' (Northstream, 2010),
- 'Smart City is the product of Digital City combined with the Internet of Things' (Su et al., 2011),
- 'a smart city is a well-defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of well-being, inclusion and participation, environmental quality, intelligent development; it is governed by a well-defined pool of subjects, able to state the rules and policy for the city government and development' (Dameri, 2013).

The measurement of the development of smart cities is relatively new in domestic and foreign literature. As the available data is often incomplete, as well as their format and characteristics show significant differences it is extremely difficult to establish a proper measurement methodology in all respects. Despite the difficulties, several attempts have been made to rank the (major) cities.

International Literature is often referred to the Smart Cities Index of the EasyPark research institute. The creators of the index first defined the factors of a smart city. First they concentrated on the factors of digital availability (4G, Wi-Fi hotspots,



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smartphone usage), and examined the factors that they believe are essential to the operation of a smart city (knowledge-based transport and mobility, smart parking, traffic sensors and car sharing apps). In their view, a smart settlement is sustainable (clean energy, environmental projection) and provides high-quality access to people living in community services, helps their active participation in public affairs.

For the EasyPark Smart Cities Index 500 cities were selected from the developed and middle-developed countries selected by the help of Human Development Index. 100 of them ranked by a predefined methodology (by 19 factors) by more than 20000 technologists and urban development journalists. When choosing cities, it was a matter of being in the widest possible range of regions, with special attention being paid to the capital cities, financial centers or other special places.

In addition to cities in the state of advanced settlements, other cities were also included which have shown significant progress in the recent years compared to their previous status. When computing aggregate values for the index, the following areas are aggregated: transport, mobility, sustainability, governance, innovation economy, digitalization, living standard and expert perception.

When compiling the 2014 ranking, they surveyed medium-sized cities where relevant data was available. In the sample, settlements could be located where the population ranged between 100,000 and 500,000, at least 1 University, a catchment area of less than 1,500,000 inhabitants. Finally 77 cities were selected for the sample of smart cities. In 2015, a similar ranking method was developed for the cities with residents between 300,000 and 1 million

The Technical University of Wien's researchers have been dealing with the issue of smart cities since 2007. Among their research results, the Smart City Model was created for medium-sized cities. Currently, the model is at its 4th generation thanks to the constantly evolving data sources (www.easyparkgroup.com).



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Country Capital City		Smart city index 2017 rank	Smart city index 2017 final score	Smart Parking <sup>8</sup>	Smart Building <sup>9</sup>	Waste Disposal <sup>10</sup>	Urban Planning <sup>11</sup>	Quality of living rank 2018
Austria	Vienna	32	6,84	7,06	9,48	7,18	7,62	1
Belgium	Brussels	62	5,64	6,11	5,50	8,32	5,06	27
Bulgaria	Sofia	94	3,78	3,68	1,61	2,50	7,09	116
Croatia	Zagreb	no data	no data	no data	no data	no data	no data	98
Cyprus	Nicosia	no data	no data	no data	no data	no data	no data	no data
Czech Republic	Prague	72	5,14	6,54	3,77	2,32	5,94	69
Denmark	Copenhagen	1	8,24	9,81	9,83	8,24	7,09	9
Estonia	Tallinn	76	4,75	3,16	2,30	7,09	7,62	87
Finland Helsinki		23	7,02	8,53	7,41	6,82	10,00	32
France Paris		20	7,14	7,20	7,14	6,38	4,44	39
Germany	Berlin	13	7,39	6,92	7,31	9,82	6,12	13
Greece	Athens	91	3,90	1,87	3,94	1,97	3,12	86
Hungary	Budapest	79	4,38	7,66	3,86	3,47	3,74	76
Ireland	d Dublin		6,59	8,10	8,18	5,24	7,62	34
Italy	Rome	71	5,19	6,14	7,75	5,76	6,82	57
Latvia	Riga	75	4,90	4,55	2,21	2,06	6,82	90
Lithuania	Vilnius	73	5,13	4,03	3,77	3,38	9,12	81
Luxembourg	Luxembourg	22	7,10	4,20	7,40	6,56	9,74	18
Malta	Valletta	no data	no data	no data	no data	no data	no data	no data
Netherlands	Amsterdam	8	7,54	7,95	7,32	7,79	5,94	12
Poland	Poland Warsaw		3,97	5,07	2,82	4,35	5,06	82
Portugal	Lisbon	64	5,46	4,98	5,59	4,79	4,44	38
Romania	Bucharest	87	4,00	5,33	1,09	1,18	3,74	107
Slovakia	Bratislava	82	4,21	3,25	3,16	2,59	6,47	80
Slovenia	Slovenia Ljubljana		5,32	5,41	5,15	6,47	9,74	75
Spain	Madrid	51	6,32	6,71	6,88	3,65	5,94	49
Sweden	Stockholm	3	7,82	7,49	6,88	8,94	7,62	23
United Kingdom	London	17	7 18	8 4 8	8 10	6.12	5 94	41

Table 2 Smart Cities Index

Source: Own compilation based on https://easyparkgroup.com/smart-cities-index/

<sup>&</sup>lt;sup>11</sup> Availability of parking apps and usage penetration



<sup>&</sup>lt;sup>8</sup> Percentage of people owning cars (city). Source: local census reports, Eurostat NUTS 2 statistical level data Number of parking spaces in city center per klm2

Smartphone penetration. Sources: local reports, online databases

Availability of parking apps and usage penetration

<sup>&</sup>lt;sup>9</sup> Research centers: Investment to research and development (percentage of GDP). Source: Global Innovation Index 2017 (report)

 <sup>&</sup>lt;sup>10</sup> Smartphone penetration. Sources: local reports, online databases

In 2011, the European Union found at least one 'smart factor' of 240 out of the 468 cities with a minimum population of 100,000. Smaller settlements were more likely to have smart properties, though smart settlements were in the category of all populations. The highest absolute number of Smart Cities are found in the UK, Spain and Italy; the countries with the highest proportion of Smart Cities are Italy, Austria, Denmark, Norway, Sweden, Estonia and Slovenia (www.smart-cities.eu).

In our study, we examined the level of capitals of the European Union in the development of a smart city. The table 2 shows the rankings of the European Union capitals in the ranking of the smart city, its final score and the value of the few factors that make up the index made by the EasyPark Group. We chose these factors because in this case we were interested in the relationship between the smart living environment and the quality of life.

After that, we investigated the relationship between the quality of living and the selected factors with help of correlation. The results are shown in the table 3. The minus sign indicates reverse proportionality, so the higher the value of the factors, the lower the value of the quality of life.

**Table 3 Correlation results** 

Smart city index 2017 rank	Smart city index 2017 final score	Smart Parking	Smart Building	Waste Disposal	Urban Planning	Quality of living rank 2018
0,8787	-0,9010	-0,6620	-0,9090	-0,8034	-0,2152	1

Source: Own compilation

#### 3. Smart City Projects in EU Capitals

The Table 4 summarizes how the realized smart city projects implemented fit into six factors of Griffinger's smart city concept.

In the next part of this study, we would like to introduce the few cities that can be regarded as the smartest city based on our available information.



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Amsterdam Smart City is a unique partnership between companies, public sector, research centers, universities and residents of Amsterdam. Amsterdam meets the requirements of all six factors. Some examples of implemented projects: Free Wi-Fi Amsterdam, Open Data Program- the target of this program is to strengthen the economy of the region by making public data sources available to citizens and businesses, Smart Light Program, Health Lab, Energy Cells ... etc.

Specific objectives of the Smart City Wien are among others: significantly reducing emissions (CO2, greenhouse gases) and, as a result, achieving EU climate protection targets. Long-term objective: a zero emission city, zero emission buildings as standard, significantly reducing energy consumption. Long-term objective: reaching close-to-zero energy standards in new and existing buildings by 2020, significantly increasing the use of renewable sources of energy (e.g. in public buildings), raising awareness in the wider public about responsible use of resources (energy, water), giving citizens (from consumers to prosumers) an active role by providing opportunities for actively controlling additional areas of daily life, promoting multi-modal transport systems by improving the public transport network, enhancing networking between individual transport carriers, and significantly reducing individual motorized transport, positioning Vienna as a model European environmental city and as a leading European Centre for research and technological development at an international level.

The projects implemented in London put great emphasis on public transport and energy efficiency. These projects are supervised by BSI (British Standards Institution), which helps to build the city's own smart city program.

Examples: Beddington Zero Energy Development, CADBEAM - Real Time Tracking for Constructions, Vehicle Movement Planning System, London Datastore ... etc.



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Smart Cities criteria						
Capital City	Smart Economy	Smart People	Smart Government	Smart Mobility	Smart Environment	Smart Living
Vienna	x	x	x	x	x	х
Brussels			x		x	x
Sofia			x			
Zagreb	х		x	x		
Nicosia			x			
Prague			x	x	x	х
Copenhagen	х	х	х	х	х	х
Tallinn	х	х	х	х		
Helsinki	х	х	х	х		
Paris		х	х	х		х
Berlin	х		x	х		х
Athens			х	х		х
Budapest			х	х	х	х
Dublin			х	х	х	
Rome			x	х		х
Riga			х		х	х
Vilnius			х		х	
Luxembourg			х			
Valletta			х			
Amsterdam	х	х	х	х	х	х
Warsaw			х	х	х	х
Lisbon	х		x	х	х	х
Bucharest			х	х		х
Bratislava			х			х
Ljubljana	х		x		x	x
Madrid			x	x	x	x
Stockholm		x	x		x	х
London	х	x	x	x	x	X

Table 4 Griffinger Smart City Concept's six factors in EU Capitals

Source: Own compilation

In 2017, the smart city ranking leader was Copenhagen, just as Amsterdam or London fulfilled Griffinger's requirements. Many programs aim to promote transport development, energy efficiency and the development of the economy. For example: Cits - Traffic Control Platform, Big Data Platform, Copenhagen Super Bikeways ... etc.



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# 4. Special Projects

We have explored the smart city projects of the capital cities of the European Union on the basis of the available information and concluded that there are many similar projects following the trend in these cities, such as smart lighting, real-time passenger information, e-administration etc.

In this chapter, we would like to present special projects, that are different than trends, which can be good examples for other cities.

Model Me in Amsterdam is an online application that lets anyone develop ideas on a map surface. These may be local events, service ideas, or suggestions for specific buildings. It encourages bottom-up initiatives and strengthens the cohesion and initiative of the local community (http://www.modelme3d.nl/).

The world's first handless mobile ticketing solution with Bluetooth LE– Amsterdam is Bluetooth solution that allows operators to track passengers with valid mobile tickets and allow them to pass through the gate without user intervention. KeyPass is easy to use. The passenger will simply download the ByteToken mobile app and use it to purchase the travel rights that are stored in the mobile app. (https://amsterdamsmartcity.com/projects/key-pass-hands-free-mobile-ticketing)

Smart bins send e-mails when they are full! – Dublin is a Wi-Fi-enabled bin can communicate when the waste reaches 85% capacity. The bin actually sends a text message and e-mail to the concerned waste management department informing them that they are ready to discharge.

Optional extra sensors can provide other information such as air quality, sound monitoring, travel time between the venue and even 25 meters of Wi-Fi! (http://smartdublin.ie/smartstories/smart-bins/).

SOHJOA driverless minibus in Helsinki is a driverless minibus that converts traffic to Helsinki Smart Region. Electric-driven minibuses were tested on public roads and passengers from autumn 2016 in Helsinki, Espoo and Tampere (http://okosvaros.lechnerkozpont.hu/en).



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# 5. Conclusion

Due to the widespread of large number of IT applications and the use of the Internet, the functioning of settlements is unthinkable without use of them. Thanks to the technical progress, there may be positive changes in the life of the settlements due to the pressure, but there are quite different paths for settlements and cities which have conscious settlement development, thanks to the tools almost accessible to everyone.

Looking at the situation of the European Union's capital cities, there are very different maturity levels. At present, there are capital cities especially in the Mediterranean, where the emergence of 'smart apps' and 'projects' is almost impossible to find, or cannot be reached at any time.

In this group the use of IT tools is likely to be possible, but there is no information about conscious strategy. In other settlements, it has been recognized that "smart applications" are essential for the development of cities, many developments have been implemented but there are no synergistic effects.

For some capitals we clearly encountered a conscious strategy, where the developments that are being implemented reinforce each other, featuring at least there is one project coordinating and compiling organization which have run by the local government or some community or private initiative. In our opinion, the future is for clearly the third-model of settlements, which thanks to the integrated development, has significant competitive advantages compared to their counterparts.

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# Development of Smart Traffic Evaluation- and Influence-Modules Based on Non-Declarative Rules of Artificial Intelligence

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#### Abstract

The paper delivers a mid-term report about a Hungarian GINOP-project, where the objectives are: development of a new methodology for evaluation and smart influence of traffic based on artificial intelligence. The basic pillars of the project are from KNUTH (1992: Science is what we understand well enough to explain to a computer. Art is everything else we do.), and from BOSTROM (2015: ...we should work out a solution to the control problem in advance...). The online engine for artificial intelligence is a product of a Hungarian INNOCSEKK project (2006-2009) – prized two times (2012ITBN, 2014HUNINNO) in frame of its applications. The similarity analysis as such in the background of artificial intelligence is capable to support lateral thinking. Therefore the problems of evaluation and influence of traffic can be handled without classic physics – based on the behaviour patterns of moving objects. Similarities make it possible to derive non-declarative rules like strategical directions for smart influence of traffic constellations. And also similarities ensure an anti-discriminative, multi-layered evaluation in an automated way, where evaluation is the input for control simulations about traffic alternatives. The first results show, that the anti-discriminative evaluation can involve arbitrary components like moving, stopping, accelerating, and/or environmental variables incl. emissions, noises, etc. The aggregated evaluation can be derived for the entire traffic system and/or also for its parts. The smart influence of traffic aiming a better evaluation value in the future involves the time series of the evaluation

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module and it derives parallel models being able to estimate the next aggregated evaluation value of traffic. The staircase functions of the models make it possible to derive effective and efficient strategies in form of preferred direction of traffic lights. The results can be checked concerning their consistence (logical connections). The next challenges in the project will be the estimation of the consistence of traffic to explore the most instable variables and the development of models being capable of deriving connection (production functions) between variables. The project involves researchers from the disciplines of social sciences in order to add multidisciplinary approach and a high level of socio-economical view to the goals and also to the execution of the project. It is nice to percept their affection on the set of goals, and on the more abstract ideas to be achieved with the mathematical an AI model like competitive advantage, added value or the phenomenon of smart products. It is revelation to be able to observe the way how an R+D project fits to the Industry 4.0 paradigm and the Smart City, Smart Transportation, Smart Metering ideas from a helicopter view. Our paper will reflect on both the mathematical and the socio-economical approach highlighting the result of their symbiosis.

**Keywords:** Behaviour Pattern, Evaluation, Strategy, Automation, Similarity Analysis.

## JEL Classification: R11

## 1. Introduction

Complex, *multilayered* system (like traffic) can only be influenced in an *efficient* way, if arbitrary parts of the system can be evaluated continuously and *consistent*, where *efficiency* means more and more needed effects per influencing activities. *Multilayered* is a system, if unlimited (measurable) attributes (like speed, acceleration, noise, stops, gas emission, etc. with preferred directions: e.g. the more the more or the more the less) can/should be aggregated in frame of an evaluation, where objects are time and space intervals (like traffic in a given street between 08.00-09.00 a.m.). System evaluation may not have *subjective* parameters (like arbitrary weights, scores set by humans), but an *objective* evaluation should prove, whether each object can be evaluated with the same value (c.f. **principle of enforced sameness**) based a *consistent* and *optimized* scoring system. *Subjective* settings are conscious or unconscious preconceptions. An *objective* evaluation needs algorithms being capable of *optimizing* scores for each attribute level, where *consistency* means that a better performance level can not be scored with a less value than a worse level of performance and attributes can only have scores through



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their levels in frame of an *optimization*. An *optimization* task can be defined through an objective function, where the principle of the enforced sameness (the **antidiscriminative modeling**) should be ensured as far as possible. The *antidiscriminative modeling* is able to deliver dynamic *norm values* and it is also capable of handling with the '*none-of-them*' option, where the artificial intelligence do not have a valid answer for a given question. In an entire *anti-discriminative* system, each object has just the *norm value* – therefore there is no possibility to evaluate.

The paper will show, how a complex evaluation can be built and how the traffic can be influenced based on similarities, where each evaluation should always have a kind of data visualization effect tool.

The original idea the traffic influencing based on similarities comes from an R'n'D project named TRAFO (Traffic Optimization System) financed by the EU and the Hungarian government in accordance with the EU tendering processes and the EU cohesion fund policy. (GINOP-2.1.1-15-2016) TRAFO project is truly technology project. (GINOP-2.1.1-15-2016-00912)

This R'n'D project aims to develop a traffic simulator and a proactive traffic management methodology based on mathematical forecast of upcoming traffic events. The central AI based application modules – will be detailed in the next chapters - are the central elements of project. The algorithm is responsible for finding the better cases and rising the goodness index of the complex traffic situation. The mathematical goal is to reach a better status of the traffic than the previous one. The other components and modules of the system are liable for data gathering and data transformation for reasons like evaluation, calibration and for real operation: Each are subordinated by the central AI module.

Through the development of the evaluation and influencing modules for traffic systems, the principles of KNUTH (1992: *Science is what we understand well enough to explain to a computer. Art is everything else we do.*), and BOSTROM (2015: ...we should work out a solution to the control problem in advance...) will



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be operationalized based on artificial intelligence methods (like chains of similarity analyses).

# 2. Evaluation module

The following chapters show the data requirements, modeling steps and the datavisualization possibilities. The basic expectation concerning the methodology for evaluation and influencing are the scalability and the generalizability. Scalability means: the evaluation and the influencing logics may not use any parameter of size according to the focused traffic system. Generalizability means: it is also forbidden to use specific parameters of a traffic systems – each involved phenomenon should be valid in every potential system.

# 2.1. Data requirements

In order to ensure the above mentioned requirements, data for evaluation of an arbitrary traffic system will always be measured without any restriction – merely the phenomena needing descriptive values are pre-defined. Of course, the more standard the measurements are, the more robust will be the results, but the feasibility of the modeling steps remains unlimited. Phenomena being handled are:

- in case of group of moving objects:
  - o speeds
  - accelerations
  - o stops
  - o gas emissions
  - noise emissions
  - o ..
- in case of the environment:
  - o temperatures
  - o precipitations
  - winds
  - radiations



- o gas concentrations
- o noise exposures
- o ...

The lists above can be unlimited flexible changed. In the modeling, data will be involved in an absolute and/or relative way that means: changes of phenomena will also be calculated. In case of a new variable, these changes are always zero for the past periods. In case of absolute values: the first/last known value is the norm for not available information units. Therefore, the following direction are able to describe an ideal system, where the environmental factors play only a role for relativisms:

- absolute values:
  - $\circ$  average speeds: the more the better
  - o standard deviation of speed-data: the less the better
  - o average accelerations, emissions/exposures: the less the better
  - o standard deviation of acceleration-data: the less the better
  - o count of stops and time being stopped: the less the better
  - o ...
- relative values:
  - o differences of speed-data in time series: the less the better
  - $\circ$  differences of acceleration-data in time series: the less the better
  - o ...

As it can be seen based on the preferred direction: the traffic is ideal, if the moving object can drive rel. fast, rel. uninfluenced by stops and/or accelerations, therefore rel. clean (efficient). Measurements can be made for each moving objects or for an arbitrary part of them. The even given part represents always the entire set. Instead of emission, gas concentrations and/or noise exposures can also be measured in different parts of the space (e.g. distances and/or heights).



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# 2.2. Modeling

Data for modeling will always be structured into OAM (object-attribute-matrix). Objects are time and space units (like a set of crossroads from 08.00 to 09.00 a.m.), where averages and/or standard deviation can be calculated. The amount of objects can be arbitrary high, but the resolution of the object ranking can also be manipulated in a free way – mostly in direction of lower resolution. Attributes are the above listed phenomena. The absolute and/or relative values of the phenomena will be standardized based on ranking, where the pre-defined directions regulate the rankings logic. For the LP-based optimization, the ranked OAMs are the inputs. The calculations deliver staircase-function for each attribute and for each ranking levels - in an optimized way. Always at least two optimizations run parallel, in order to be capable of checking symmetries between the staircase-structures as a minimal action for a consistency-oriented model quality assurance. The estimated evaluation values can be the same in an antidiscriminative model based on similarities, if each object has advantages and disadvantages. If the estimated evaluation values can not be forced to become the same (norm) value, then the system (described through their time-space-objects) has better, worse, norm-like and undefined phases (c.f. Pitlik, et al, 2018a).

## 2.3. Data-visualization

Figure 1 shows a static evaluation for a given time interval and for 5\*5 parts of a traffic system, where greenish stands for better evaluations, reddish means worse circumstances, and yellowish is for the norm-like situations. Grayish would be a spot, if the symmetry-check could not deliver valid estimations. The evaluation can be re-calculated every time, if a new object is given. The animation of the static evaluation delivers a movie with some changes of colors for the focused spots.



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Figure 2 Demo map without and with evaluation layer Source: <u>http://www.bestinfo.hu/terkep.jpg</u>, 2018, and own presentation

## 3. Influence module

The AI-based influencing effects are decentralized in a lot of specific functions (like supporting highlighted objects: e.g. vehicles of fire-fighters) collaborating with a common big-data-sea in the background. Influencing effects can be achieved in two different ways: detecting problems and reacting and/or forecasting problems and preventing.

The reaction-based strategy (like specific solution of chartists) needs facts and mostly declarative rules (e.g. AAA - autonomous adaptive agents), where adaptation means interpretation of facts through relative simple rules.

The prevention-based strategy needs forecasts e.g. about the goodness of traffic in the next time-intervals. Models being capable of description of traffic changes in the future can also deliver functions between raw measurements and aggregated goodness values. The raw measurements (like average speed of moving objects) can be influenced in order to avoid/minimize the forecasted problems.

The next two chapters show examples for the prevention-based modelling:

## 3.1. Derivation of strategies

An arbitrary traffic system can be described through e.g. the streams (amount of vehicles / time-interval) on different spots (c.f. Pitlik et al 2018b). These raw



variables will always be involved into the modelling of goodness. The goodness values of the previous time-intervals can have a trend. If this trend shows a kind of increasing (it means: the traffic will even be better without any influencing), then the influencing module do not send any commands to the influencing motoric. If the trend is negative concerning the goodness values, then it is necessary to search for preventing actions. Traffic can only be influenced in a rational way, if the logic of changes can be modelled. With other words: If the changes in the future can be forecasted. The simplest forecasting structure is, where the raw data for antidiscriminative evaluation have to forecast the evaluation value for the next timeinterval. It is also possible to work in a parallel way, where forecasts can also be generated for further time-intervals in the future and these forecasts can increase or decrease the intensity of preventions (e.g. forecasts about more and more consolidated future make possible to decrease the intensity of interventions and vice versa). If a robust forecasting model is given, then the needed simulation tool is also given in case of staircase functions of the similarity analyses. The explored stairs show, whether each raw variable has influencing potential at all or what kind of stairs of a given raw variable have relevant influencing potential. The simulation system has only one challenge to manage: the next time-interval based on the last facts from the big-data-sea. A traffic system can be influenced in several ways at first based on one raw variable needing changes. For each alternative, a lot of descriptive statistics can be calculated (like risk, inertia, etc.). The best solution can be derived based on the (already known) antidiscriminative modelling approach – involved into the evaluation module. It is also possible to influence more than one raw variable. The hybrid solutions can also be evaluated through the simulation model. The above outlined logic determine a kind of preferable direction for the next time-interval, where the expected exposure of the entire system can be regulated with the highest impact. The highlighted direction in the traffic system will only be preferred in the reality, if real needs can be detected. Therefore a probably useless estimation for the preferable direction has no negative impact for the system. If the raw variables describe not only outward directions but inward



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directions too (or in an inverse model exclusively), then the influencing mechanisms can work for a kind of parallel braking effect, where the given system has less and less exposure.

#### 3.2. Exploration of genetic potentials

Genetic potential means (cf. Pitlik, *et al*, 2018c) what is the highest raw value in a traffic system being realistic based on the proportionalities in the known system? The derivation of the genetic potential for each raw variable support the risk management for the entire traffic system, because an expected value near to the genetic potential can be realized with less probability, then in the middle of the realistic interval.

Genetic potential is a specific system property: it is an estimation calculating from staircase functions, where the highest value for each raw variable is symbolized through a rank value (=1.). For derivation of a genetic potential value, it is necessary to create production functions between n-1 raw variable and the preferred one, where n is the amount of all the raw variables in the system.

Complex systems like traffic can have complex connections between the raw variables, where the classic directions can not always be pre-defined in an easy way. The best production function can be explored based on the principle of the Occam's razor, where randomized and/or (stepwise) rational derived set of production functions can also be evaluated based on the anti-discriminative model techniques (like before e.g. in case of the evaluation module). It is possible to have more than one quasi ideal production functions. In this case, the alternative estimations about the genetic potential can be interpreted in the simplest ways: the minimum of the alternatives has the less risk.

Here and now, the term of non-knowledge should be introduced in order to show: artificial intelligence solutions should not always have an answer to the question. Therefore the non-knowledge is also a kind of information, where the big-data-sea



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produce just foggy estimations. But fogs are dynamic phenomena – so, one of the next time-intervals can support the decision making processes again.

## 3.3. Bottom-up approach without intertextualities

Analyzing the tender documentation, it is clear that the idea owners have a bottomup approach. The main idea is clearly articulated as a technology- and algorithmbased solution, detailed before. The high-level design lists the items, the sources, the technologies, the most important list of features. And you can find not a hint on wider context. From the social science and economic point of view it is not wired to any general paradigm. Having the chance to participate in the project, the reason seems to be simple. The idea owners were not aware of the fact they are making something that relates to a wider perspective or it was not important to make the missing links for any reasons.

Summarizing the objectives, the TRAFO R'n'D tender documentation shows that the planned system is divided to multiple autonomous elements with delegated decision making and information generating duties. The communication is based on the cloud solutions. The sensors generate the relevant data. Big data and AI software modules generate the information for the simulation and the modelling. The autonomous modelling makes decisions that could be executed by an outsource traffic management system.

The settings above conclude the Industry 4.0 (I40) technology keywords (Lu, 2017) (Bloem, *et al.*, 2014) without making the inevitable mental step, putting the idea into the I40 perspective.

To support this statement, we made a semantic research on the content of the tender documentation. There is no reference to the following terms in it: Industry 4.0, smart traffic, IOT. It means that the project scope was absolutely out of context. On the other hand, several relevant technology related expressions can be found in the tender documentation at the same time: sensor 36 times, parameters 23 times, mobile app 10 times, software 12 times, autonomy 3 times, big data 2 times, M2M



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2 times. The reference to these expressions did not have a detailed exposition, specification or specific technology choice. They are more like guidelines or keywords than technology decisions.

According to our previous studies we attempt to analyze the intertextualities and define the missing links to I40 paradigm.

Our founding about the core function of I40 can be defined as the following regarding value proposition (Gyimesi, 2018):

I40 project value proposition= utilizing the new technologies + generating information + using autonomous decision making procedures + policies for reaching a defined business or operational goal + deficit management + applied I40 framework

	<b>Business Goal Layer</b>	Features, key words	Add value	Goals reachable	
1.	Business-Sales Layer	New products, Smart products,	Business	New Business,	
		Online connection with the	innovation	New Revenue	
		product, Networking, Product-	from		
		services-information based	Information		
		business, Platforms			
2.	Internal Processes -	Efficiency, Cost reduction,	Effectiveness	Effectiveness,	
	Cost Effectiveness	Monitoring - controlling,	from	Competitiveness,	
	Layer	Decentralization, Smart x,	Information	Cost Reduction	
		Automation, Robotization			
3.	Technology Layer	IoT, Sensors, AI, Mobile, Edge	Information	Information	
		computing, Collaboration,	from Data		
		Applications, Autonomy systems,			
		Big-Data, CPS			

By design there are decision levels to be built one-on-one we put to a simple layer model (Gyimesi, 2018):

The study shows that technology itself does not generate I40 initiative. Clear strategic business goals (Business layer), effective deficit management and risk mitigation, and I40 framework management is needed. (von Leipzig, *et al.*, 2016)

Strategically thinking the decisions about the aimed Business Goal Layer is a must. In the TRAFO case none of the decisions were made by the project owners



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consciously. Nevertheless, the characteristics have been discussed later on the think-tank meetings.

- Detailed goals of the project
- Comparison to the existing solutions
- Probabilities of installation to the existing traffic management systems
- Add values
- Advantages (articulatable) to other smart city solutions
- Integration issues, links to external systems
- Exclusivity, inclusivity possibilities of interfacing
- Set of functions wider the better, useable is the better
- Set of direct impacts on the traffic
- Set of indirect impacts on the surroundings
- The possible ways of usage local, general, extendable
- Meaning of the term: general solution
- The measurement of the validity of the general solution
- The idea and the meaning of goodness index
- Possibilities of income models
- Value of the data and information generated
- Ways of further development
- Visions of the future traffic and traffic management
- Possibilities of penetrating a social network based traffic management system
- Project deficits
- Lack of element
- Deficits for execution
- Main decisions regarding the project
- Detailed technology decisions and interfacing

The answers to the listed topics draft a complex I40 management framework including strategic and action planning level as well as making core decisions.



TRAFO retroactively became an I40 project. We have to emphasize that there was not a word about that in the tendering documentation. It was not a will. It happened by accident.

The recent understanding is converse. The project itself identified the I40 key characteristics of the TRAFO retrospectively along with the project meetings.

The core I40 related decisions has been finally set and can be seen below:

- I40 Business Goal Layer: Business-Sales layer New business by I40
- I40 Technologies: Android, MongoDB, Cloud-based AI-server with API
- I40 Deficit management and risk management within the project management along with the TRAFO I40 management framework

We can also show the TRAFO I40 value proposition applying the theoretic function.

TRAFO I40 value proposition = I40 technologies + traffic related data defined controller information + AI decisions for better traffic statuses + new I40 related business opportunities by the project + risk minimization as deficit management within the project management + core decisions by the I40 framework

With these findings the project has been given the missing economic frame extended additional methodical and decision making elements and also new energies.

## 4. Conclusion

Similarity analyses are capable of aggregation multilayered inputs for evaluation of complex systems like traffic. The similarity-based evaluation do not need any subjective numeric value like weights and/or scores. Idealized directions for the involved variable should be pre-defined by human. The evaluation can always be executed in an optimized way. The evaluation process has parallel models for ensuring consistency or leading to exclusion of objects from the evaluation itself. Estimated evaluation values can be visualized in a GIS-like frame layer by layer and in aggregated levels. Influencing of traffic can also be achieved in a similarity-



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oriented way. In the future, the potential influencing strategies will be evaluated based on the logic of Occam's razor as the central thought of TRAFO.

The project is – at last - managed by an applicable I40 decision making and management framework. After making the basic evaluations and decisions the focus points can be kept steady. The resources and the priorities are set also. The bottom-up approach attitude of the mathematicians and the top-down value-oriented view of the economists jointly ensure the progress and the quality of the project belonging the I40 paradigm.

#### Acknowledgements

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# The Relationship Between Public Transport and Tourism in Budapest

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#### Hungary

#### Abstract

In 1999, the MONITOR Institute for Social Research and Methodology Center commissioned a survey by the Hungarian Tourist Board with the name "The opinion of foreign tourists on public transport in Budapest". Compared to the situation experienced by us, the survey has set the relationship system of public transport and tourism in Budapest very positively. According to our investigations, there have been positive changes in public transport, as in the area of information, the acquisition of information via the internet has become a major factor by 2017. Furthermore, based on the feedback, it can be said today that the established transport network can be considered good, orientation is easy, connections are good. We also discovered similarities between the two analyzes, with the use of the means of transport used, the bus, the metro and trams were used by most. As a motivation for use, price and speed also showed the same result. The purchase of discount cards or even weekly tickets was not particularly significant in 1999 or now, the use of the Budapest Card has increased only in the case of organized trips. The number of negative reviews has increased considerably, and by 2017 it has become visible to customers as well that the Budapest Transport Center (BKK) faces significant financial shortages. There is still a problem for tourists in terms of the employees' low level of foreign language proficiency and lack of information in foreign language. From the point of view of service, serial failures and low number of ticket vending machines, the age of vehicles, crowd and ticket controllers' behavior caused negative feelings from respondents. Among the students studying here, the extension and compression of night traffic was also showing bigger demand. In our research, we are going to analyze the results of previous and current surveys, as well as the differences between them and their causes, and aim to present the actual changes and tendencies

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Keywords: Public Transport, Local Transport, Transport Network, Tourists, Budapest.

## JEL Classification: R42

#### 1. Introduction

The public transport of Budapest is a complex and huge machine with a long history, with a global and European perspective. Over the past few decades, we have witnessed the transformation of the capital's public transport, which was influenced by the local and international tourism changes as well as by the attractiveness of Budapest's guests, city structures and attractions.

The present research consists of three parts: Firstly, in 1999, on the basis of the MONITOR Social Research Institute and Methodological Center, "Survey of foreign tourists on public transport in Budapest", on the one hand, and on the other hand, a 2016 online and personal questionnaire and thirdly from a 2018 online questionnaire. While the first two research subjects were foreign visitors, the third questionnaire targeted the Hungarian passengers and users.

In the course of our research, we are going to analyze the results of previous and current surveys, as well as the differences between them and their causes, as well as present trends and tendencies. We want to focus on the causes of change and the factors influencing the development of tourism and transportation.

The objective of our research can be divided into three parts. It mainly consists of the implementation of a fresh questionnaire survey, which shows the needs, satisfaction and preferences of the Hungarian - mainly young - population in connection with public transport in Budapest. Second, our aim was to analyze the results of two researches carried out in the past based on current trends and current observations. Third, on the basis of our observations, we wanted to draw conclusions on the role of public transport, the needs of passengers and the transformation of these.



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#### 2. Overview and tendencies

The capital city has four subways, 27 tram trains with 593 vehicles, more than 200 bus lines with 1,600 vehicles, 14 trolley buses, five local railways, Danube ships and other special and nostalgic lines. These numbers are considered high in terms of the size of the capital. It is true that the number of metro lines is small on European level, the network of surface transport and the number of vehicles are high. It can be stated that public transport plays an important role among the residents of Budapest as well as visitors to the city.

In the past decade a number of changes have taken place in the capital's transport, which can be called a modernization process. Mass transport' has been renamed to 'public transport' and this new attitude has been attempted to translate reality into everyday routines. It was an important step when the Budapest Transport Center (BKK) was established in 2011, with the main task of coordinating urban transport as а whole and coordinating the activities of individual operators. In the years of 2010, improvements were also made to users. Among them, the FUTÁR system, which was installed in 2014, provides real-time information on online and on-screen ways using accurate and current data from vehicles. This involves the BKK Info system, through which passengers can be informed about possible - planned and unplanned - disruptions and changes to routes. By 2015-2016, ticket purchasing opportunities were renewed, and modern ticket and pass vending machines were introduced all over the city, and today they have largely taken over the role of ticket offices.

There was a growing need to purchase new vehicles and to increase the supply of low-floor, wheelchair-friendly vehicles, especially with regard to a large number of bus fleets. This has also begun, but the exchange is slow and costly. The process is improving, but it is still below the correct level: 19% of vehicles still consist of buses manufactured before 2000 and only 50% of the buses are produced after 2010.

More and more important area to be explored is the taxi service, which is an integral part of the capital's public transport. This is closely linked to the availability of the



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Liszt Ferenc International Airport, which is largely provided by two means: the taxi and the bus service, the new version of this, the bus 100E provides direct access to the city center since 2017.

#### 3. Methodology and results of the research

Our own research consisted of filling out and evaluating a six-question online questionnaire. The issues focused on the main motivations of public transport, the ticket and lease constructions used by respondents, the evaluation of the most important factors influencing new developments, services and the quality of service, and the tendency of change in their quality. Most of the participants in the research were given by the 18-22 age group, which probably influenced the results obtained in several points. The age of over 40 was only 16%. (Figure 1) Thus, this research can be seen as an overview of the views of young and young middle-aged people.Most of the respondents use public transport to work and school, 53% of them use it during the nightlife and evening entertainment. The same amount uses it for other urban journeys. Interestingly, only 10% responded to airport access and 10% rarely use public transport. (Figure 2)More than 81% of those interviewed have a Budapest travel pass, only 16% of them use single tickets. Questions about public transport were also raised with regard to taxi usage. No one uses taxis to work or school, but 53% rarely, 25% never uses this form of transport. 22% of respondents associated evening programs with their taxi journeys and 18% of them use the taxi to/from the airport. Only 2% of respondents chose other urban journeys as a reason for taxi usage. (Figure 3)

The answers to the question about the knowledge and active use of new systems were interesting. Ticket and ticket vending machines are popular with 85% of respondents. With the online travel agent website and mobile application called BKK Futár, 51% of the respondents are planning their way. However, only 38% use the traffic monitoring section of the same application. The BKK Info travel



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information service, which is also available online and by app, is used by 26%. Surprisingly, the rate of users of taxi applications is only 11%. (Figure 4)

A comprehensive and very interesting part of the research was the question of the quality of the service and the results of the change in the quality of these aspects. (Figure 5 and Figure 6) The service level was divided into ten different influencing factors. These included, among others, the reliability of taxis, such as experiencing fair pricing, and the number of taxis. The majority of respondents believe that the reliability of taxis is acceptable, but the second place was the bad judgment. According to the big majority, there is no quality change in this. The amount of the taxis is acceptable and good, and many have experienced a positive change. The next aspect was the state of the public transport vehicles. Vehicle age statistics are well-known and not good in the capital, but the trend seems to be positive on the basis of data and vehicle purchasing efforts. The majority of the questionnaire head-to-head - judged this quality aspect as acceptable and bad, and although most people are experiencing a progressive, astonishingly many perceived deteriorating tendency. Three questions related to the new types of systems and amenities that were mentioned before. It should be emphasized that many rated the ticket and pass purchase procedure, as well as scheduling information, as very good or at least acceptable, and many fillers have classified them as excellent. In the case of these two aspects, the majority of fillers also experienced an improving tendency. In the event of a disruption, passenger information was given a more subtle assessment, as nearly as many were considered as bad as acceptable and few were good. The tendency in this case is, by the majority of fillers, also improving but as well stagnating according to many. Four more questions were asked about daytime and nightline networks. The coverage and timetable of the daytime network is rated by most by good, and many have rated it as acceptable. Most of them see an improvement, lot of them see stagnation. The judgment of the night network shows a more negative picture. The number of people is outstanding, who only rated this as acceptable, and the same amount of people considered the night schedule and



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network coverage as good as bad. The majority of respondents in this case stated that they did not notice any change, but many filler tend to see improvement as well.

#### 4. Comparison and Conclusions

The research carried out in 1999 was mainly conducted with the participation of tourists from abroad. Due to the lack of technical possibilities and capabilities, it is difficult to compare this with today's situation. It is important to note the most important results of the research are: "... in terms of ticket and ticket sales, it is clear that they did not use the various discount packages. More than half of the respondents traveled with a single ticket or bought bullet or section tickets. At that time, only 8% of them used passes and only 5% used the benefits of Budapest Card. (...) ... 90% of respondents said they did not have unpleasant experiences. Those who still experience some kind of negative experience, above all the delays, thefts and behavior of the passengers, and the attitudes of the BKV staff are also worth the criticisms, most have missed helpfulness." (Monitor Institute for Social Research and Methodology Center, 1999)

With the help of the 2016 research, its relevance makes it easier to draw conclusions. 70% of respondents were informed about the details of public transport via the Internet. Interestingly, 14% of respondents considered printed publications as important, so this was the second most important form of information.

It seems from all the research that public transport in Budapest is very important for tourists and local people as well. Local residents use passes in large number, but there are still a lot of passengers with single tickets, which also increases the potential to travelling without paying.

Foreigners are often unaware of the different types of tickets, orientation is not easy, and many of them are in conflict with ticket inspectors. Arriving at the airport, the number of ticket machines is insufficient and the offer of passes for tourists is also inadequate. The airport can be reached by public transport by bus and taxi. 118% of the locals use taxi for this purpose, but less than 11% uses bus. The probable



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reason for this is the expensive price of the first, and the long travel time and lack of comfort of the latter. All in all, local people use taxis in a way too small amount. The situation of foreigners is, of course, different, because they are given to local conditions and qualities that they do not necessarily know. The 100E bus that runs directly between the airport and the city center offers a solution for many to access the airport.

It is important to mention Budapest's transforming guest content as well. After the economic crisis and the bankruptcy of Malév, the high number of business tourists has quickly declined, and the huge conferences are also missing. Gábor Michalkó explored the role of taxis in Budapest in 2007. Among other things, he analyzed the main taxi journey destinations of foreign tourists in the capital, among which the first was the airport, followed by hotels, sights, restaurants, railway stations, spas and other sights. (Michalkó, 2007) These characteristics have changed since that time, mainly due to the higher price sensitivity of tourists. The majority of tourists arriving in Hungary are groups coming by boat or by bus, and if by flight, they have their own transfer from the airport. Many visitors of Budapest are not reluctant to use the airport bus as it is much cheaper than getting into the city center by taxi. The tendencies of tourism, therefore, are more of a challenge for the taxis companies and a vantage for other means of public transport.

It is also worth mentioning the transformation of the nightlife of Budapest, which took place in parallel with the transformation of the guest content. More and more young people arrive in the capital, whose main purpose is to have fun and relax. The main meeting point for these guests is one part of the 7<sup>th</sup> district called the party district. It's enough to go long on Király Street in the night, and besides the many Hungarian and foreign parties, the street is full of taxis. The taxi drivers are already carrying out a larger number of in-town night-time journeys, than airport trips. The comfort services launched in public transport and the tools for sales and the flow of information are successful and have achieved their goal. In the field of taxis, however, the necessary improvements in these important areas have so far failed.



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In the light of the above, it is clear that the center of Budapest has become a hub of night life, attracting masses of Hungarians and foreign visitors. For this reason, there is an important demand for passengers to develop the nightlines and their timetables, and in this regard, they expect a greater improvement. It can be seen that passengers are the most critical in terms of information facilities in case of malfunctions and the status of vehicles. There have been many improvements in these two areas, which are less conscious in the users and reached less their goals.

#### 5. Summary and recommendations

The shaping of public transport in Budapest needs to take into account, on the one hand, the needs and expectations of the local population and their main critical aspects. On the other hand, it is important to dynamically develop public transport closely with the trends in the composition, customs and needs of tourists coming to the country. With new kinds of ticket types and more pass offers, locals and tourists can also make the use of public transport easier and more economical, thus reducing the number of journeys without ticket and negative feedbacks.

Promoting taxis would be an important element in shaping local people's transport habits. In addition to checking the proper functioning of taxis, the service should be simpler, more transparent and, above all, modernized, including centrally managed order picking and labeling, and involving modern communication tools in passenger information and billing. It would be important to spread this effort among the users, so building interest and trust in the service. Winning the local population is of particular importance due to the decline in the number of paying foreign visitors. It is necessary and essential to continuously monitor the legal and correct operation of taxis.Due to the enormous success of the 100E airport bus, the service should be expanded and information on the airport should be improved, ticket purchases needs to be developed.Regarding vehicles and passenger information at critical points, huge improvements have been made and should continue in the future. Public transport is used by a huge base and many types people. Not all needs can be met,



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but efforts must be made to achieve this. Public transport in Budapest performs well and develops in many ways. The additional opportunities for innovation should be noted, as well as the efforts that have been made so far should be continued; so dynamically evolving in parallel and together with the city, its residents and visitors.

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# Figures



Figure 1 Age of the responders Source: own research (questionnaire), own editing



Source: own research (questionnaire), own editing



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Figure 3 What applies to you regarding the usage of Budapest taxi transport? (%) Source: own research (questionnaire), own editing



Figure 4 Knowledge and frequent usage of new systems. (%) Source: own research (questionnaire), own editing



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Source: own research (questionnaire), own editing



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Figure 6 Opinion about the change of the service quality in different fields (distribution) Source: own research (questionnaire), own editing



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# **Resilient Small Towns in Hungary?**

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Hungary

#### Abstract

After the political, social and economic transition there were new challenges for Hungarian settlements. In Hungary there are 3155 settlements: 346 towns and 2809 villages (with local governments), and the population of 100 smallest towns are below 5000 inhabitants. In our paper we analyze the resilience of Hungarian small towns: the quarter of them, which are the centers of administrative districts, were analysed in detail. There is a case study also in this paper about Tab town. The main problems of the local governments are decreasing of population, the employment, the unfavorable or changeable (often one-sided) local financial conditions (an uncertain budget), and the variable Hungarian legal environment (changing regulations). Some of the problems can afflict the settlements in a short time, and the solutions have to arrive quickly, also, but they often do not have appropriate local tools, thus the degree of resilience is not appropriate. In this situation one of the possibilities is to strengthen self-sufficiency of the settlement.

Keywords: Resilience, Small Towns, Population, Local Government, Hungary.

#### JEL Classification: R10

#### 1. Introduction

After the political, social and economic transition there were different challenges for Hungarian settlements. The new constitution of Hungary (1989) stated that the territory of the country is divided into capital, counties, towns and villages, and the commune, city, capital and districts, as well as the communion of county voters have the right to local self-government (IX. Chapter). The fundamental rights of local governments are equal, but the responsibilities of local governments may vary.

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These are governed by the LXV/1990. law. (After 2011 the new constitution and the new law about the local governments state it also.)

In 2016 in Hungary there were 3155 settlements with local governments: 346 towns and 2809 villages. The number of towns increased quickly after the transition, in 1990: 166, in 2000: 222, in 2010: 328 towns were in Hungary. The obtaining of city status is governed by a regulation, and the settlements might give application for the status. In 2000s a lot of small settlements got this status, and in 2016 the population of 100 smallest towns are below 5000 inhabitants.

In 2013 a new territorial subdivision was born in Hungary: 175 microregions ("járás") of government administration were created. All of them got a center, but some of them are small towns, because the spatial dispersion of large cities is unequal. The population of 23 centers of administrative districts was below 5000 inhabitants/settlement. In this paper we analyze these small towns (Figure 1.). These towns are in the Transdanubia and in the northeastern part of Hungary. In the Hungarian Great plain there are not small towns due to historical reasons. Only some of the towns are well-known settlement in Hungary. Pannonhalma (abbey) and Tokaj (wine region) are the parts of World Heritage, in Záhony and Letenye there are important border crossing points to Ukraine and to Croatia. Fonyód is a famous touristic town at the Lake Balaton, and Devecser has become famous for a disaster (see below). The other cities are known rather just in the circle of regional researchers (Pétervására was the smallest city in Hungary for a long time, in Bélapátfalva there is a famous old abbey and in socialism a large cement factory was here, Szob is famous for the food-industry, Bóly for the agriculture etc.).



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Figure 1 Microregions of the 23 small towns in Hungary

The main problems of the local governments of these small towns are similar, and the difference between them is the speed of the processes: some problems persist for a long time and slowly weaken the settlement, and some of them can afflict the settlements in a short time, and the solutions have to arrive quickly. The latter depends the resilience of the settlements: the reactivity of the local societies and local governments.

The notion and concept of resilience has been applied to social and economic fields, local and regional studies in the last few decades. The resilience has multiple meanings (Tóth, 2015), in this case we accept the opinion of Forest (2007, 14), but in local context: "regional resilience as the ability of a region to anticipate, prepare for, respond to, and recover from a disturbance". In our paper we analyze the resilience of the small towns of Hungary.



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#### 2. Small towns of Hungary

In Hungarian geography the definition of small town is not clear. Before 1990 because of their small number these towns were in the background: mainly some case studies were published about them and in some papers of settlement geography was mentioned them (Pirisi, 2008). After 1990 and the quick growth of their number, these have become important element of the Hungarian settlement network.

There are different opinions about the size of the small town in Hungary. Some researchers think the border is 30 thousand inhabitants, others think 25 thousands or 20 thousands (Pirisi, 2008), and for example in a Hungarian official document (NGM, 2017) the 10 thousand is the border. If we look at the actual scale of towns, from 346 towns 100 have less than 5000 inhabitants. We use this border.

In this paper we examined the cities of Hungary below 5000 inhabitants. We narrowed that list to 23 small cities which are district centers, and topic of our research is the economic and social traits of these cities. We looked for evincible sudden changes and their reasons in the time series analysis of data.

At first the changes of population were analysed between 1990 and 2016 (Figure 2.). There are three settlements where the rapid population decline is conspicuous (Fonyód, Vasvár, Rétság). In the background of these changes there are administrative territorial amendments: some parts of the towns became independent settlements (Fonyód: Ordacsehi, Balatonfenyves; Vasvár: Alsóújlak, Rétság: Bánk, Tolmács). This a kind of challenges which can hit settlements, but in these cases there were not serious effects of the changes to the small cities. (As opposed to the case, for example, when in the new settlement will be those companies, which pay the local taxes to the local government (e.g. Kazincbarcika town – Berente village).) A smaller population decline can be observed in the city of Devecser between 2010 and 2011. In the background of the negative change is a natural disaster: in 4. October 2010, the gate of the red mud reservoir of alumina plant in Ajka was falling



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through, and ten people died, 150 people were injured, and later more than 300 people migrated from Devecser.

The population of other cities usually declined, mostly with 10-15%, from 1990 to 2016. Only three towns were able to achieve smaller growing population: Kemecse, Bóly and Baktalórántháza. Kemecse has an economic development based on the agriculture, but at the same time the migration balance is negative, so the natural reproduction results the growing population. In Baktalórántháza the migration balance is negative also, and the natural reproduction is the reason of the positive change. In Bóly the succesful agriculture is the important element of the local economy also, and the positive migration balance can compensate the natural population loss.



Figure 2 Changing population of 23 small towns in Hungary, 1990-2016 Source: Central Statistical Office [KSH]

The unemployment was a serious problem of the Hungarian settlements after the transition. An important function of cities is to provide employment possibilities for the inhabitants of surrounding villages. In the small towns providing workplaces is



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problematic because of limited possibilities, and in 2000s it was also true for the Hungarian small towns. After 2008, the year of economic crisis, the number of job seekers was increased in most of analyzed towns (Figure 3.). In 2013 a new Hungarian law launched a "public work program", so there was a macroeconomic answer for the local problems from the government, and in most of the analyzed towns declining unemployment was described. The sudden rise of the number of unemployed people (more than 100 people/year) can be found only in four towns: Baktalórántháza, Csenger, Tét and Csurgó. The closure of local firms and the decreasing workplaces in the neighboring cities may be in the background.



Figure 3 Changing number of job seekers in the 23 small towns in Hungary, 2000-2016 Source: Central Statistical Office [KSH]

In the case of small towns, some problems derive from the contradiction between the social, economic weight and the expected functions of the centers (undersized, oversized services). For those towns, where were central functions formerly, this is not a new role. For example 21 of the 23 towns were central places in the previous system of microregions of regional policy (between 1994-2014) (exceptions: Bóly,



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Kemecse). The problem with new administrative function was often the lack of qualified people, and the accessibility of the town from the surrounding villages. In the former case, thee was need for the resilience.

The budget of these towns is based on unfavorable or changeable (often one-sided) local financial conditions (an uncertain budget). The income from local taxes in most of the towns are low.

We think one of the actual main problems is the variable Hungarian legal environment and changing regulations in 2010s. For example the new law (CLXXXIX./2011) about Hungary's Local Authorities has changed a lot by other (35) laws between 2011-2017. (These laws are: CXCVI/2011, CCI/2011, XXXI/2012, XXXVI/2012, LXXXIV/2012, CVI/2012, CXVII/2012, CXLV/2012, CLXVII/2012, CXCV/2012, CCIX/2012, CXLV/2012, CLXVII/2013, LXXXVI/2013, LXXXVI/2013, LXXXVI/2013, LXXXVI/2013, LXXXVI/2013, CXXVII/2013, CXXVII/2013, CXXVIII/2013, CXXVII/2013, CXXVII/2013, CXXVII/2013, CXXVII/2014, XCIX/2014, CI/2014, LIV/2016, LXVI/2016, CXVI/2016, CLXXXV/2016, L/2017, CXXXIV/2017.) The problem is that, the legislators are resilient, but the acceptance of the newer and newer changes is difficult for the local governments.

Some of the problems can afflict the settlements in a short time, and the solutions have to arrive quickly, also, but they often do not have appropriate local tools, and the external help and supports are only partly applicable tools to solve problems, thus the degree of resilience is not appropriate.

# 3. Case study: Tab

Tab is a small town in Somogy county, it lies in the western part of Hungary, south of Lake Balaton. In the 13<sup>th</sup> century a small village was here. In the Middle Ages, during the Turkish occupation the population died or escaped. In the end of the 17<sup>th</sup> century the area was populated again. In 1847 the settlement became a market town, and in 1871 got the status of center of small administrative area. In the turn of the



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century intensive economic development was in the town. The 20<sup>th</sup> century brought more damage to the settlement, in the World Wars a lot of habitants died and the development has stopped. During the socialist period Tab did not develop, but it was a center of a small administrative area.

It was an agricultural settlement, but in the era of socialism it lost it has role as a district centre and after the structural transformation it's profile shifted to industrial. However, in the life of the settlement the agricultural features remained but changed a lot. The number of settlers increased in the settlement because of the industrialization and that was the basis of urbanization. The city is outside the pale of development axis of the country which was established in the National Development and Regional Development Concept (OFTK).

Nowadays the city of Tab provides services at basic level of polity that would not be because of the centralization then the subregion would be more functionless, and the availability of services would be reduced. Tab is one of the small cities that have a rare provider and intermediary institution which rows the small towns in a more comprehensive settlement network.

In the year of 1989 the population of Tab, which had a city rank by then, decreased constantly. In 2018 the population is near 4300, which has decreased by 15% from 1989. In the background of the decline are the migration and the aging what can be traced back to the conversion of agriculture, according to Jenő Schmindt, the mayor of the city. To stop the population decline, and recover from it can take a lot of time. The biggest challenge for the city of Tab is to stop the population decline. The city council has just few means to solve this problem.

Furthermore, the mayor of the city said that to ensure human resources for the settled companies is an important challenge too. Nowadays the council of Tab works on development of the urban environment to maintain it's population. The aging is typical of the city, which is a real problem in 70% of the microregion. Tab had a district centre rank till 1972 and gave it back in the year of 2013. The new rank did not cause any problems because it has a same rank in the past. The



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infrastructure and the material conditions were given in the city. In the same time there was hard to replace the human resources because of the migration. The District Office was the first one which was renovated because the council was afraid that the remaining employees will quit because of the bad environment.

To maintain the contact between of the council and the biggest company in the city and the subregion called Flextronics International Kft. is one of the biggest challenge, because it can influence the life of the city on a large scale, according to the mayor. He said the city have to react even the smallest change to follow the infrastructural changes and the stability of the labour forces. Besides he finds the development of infrastructure, cityscape and social care important also to maintain the workplaces.

Besides he finds the development of infrastructure, cityscape and social care important also to maintain the workplaces which were insured by many tender sources won by the council of Tab. Whit these allowances the city can not realize the most urgent developments because they can apply only those tenders that are available and not that is needed. In the light of that the city needed 150 maisonette 10-15 years ago to provide they to employees but there was not any tender for that. In the secondary school of the city start new vocanionals like electronic technician is a goal to have enough qualified labour force for the settled companies.

#### 4. Conclusion

In Hungary the new legal conditions of local governments do not give many tools in the hands of settlemens to solve the local problems, mainly for the sudden emergences. To alleviate the damages of natural disasters is financed usually by government, but the suddenly appearing local social economic problems are in local treatment. In actual situation one of the possibilities is to strengthen self-sufficiency of the settlement, mainly the enlargement of local incomes is important (more tax revenue has to be transferred). Important element to provide more predictable legal environment by the government, also. (After the national election in 2018 the ruling



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party did not change, so major changes are not expected, but the recent past shows that it is not predictable in Hungary.) At the same time that is important, in Hungary a lot of things depend on the government actually, and the political relationships are very determinative. Not the resilient of the settlement is the key of the successful, but the utilization of the political relationships.

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# Hungarian-Slovak Cross-Border Research on the Labor Market Opportunities of Disadvantaged Job Seekers

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#### Abstract

The purpose of our labour market research is to obtain data on the employment status of the two countries in the economically less developed border regions (Hungary: Salgótarján, Balassagyarmat, Slovakia: Losonc, RimavskaSobota). As the method, we work with a quantitative, online questionnaire survey. In our research we focus on the employment opportunities of disadvantaged job seekers (long term unemployed, poorly educated population, career starters) in the designated areas. There are a large number of arguments related to the research, as the local labour market faces many difficulties (high number of poorly educated job seekers, high unemployment rate, low employment rate) from year to year. By interpreting local employers (at least 25-30 per region, SME's and multinational companies), we compare the characteristics of the two geographical areas, the possible similarities and differences related to the demand of the employers, and explore ways and special active labour tools to improve the labor force of the Hungarian and Slovakian regions. Beyond summarizing datas of the online survey, by presenting good practices and joint programs, previous cross border actions we draw attention to the potential of the cooperation between border communities and the opportunities offered by NGOs in employment and adult training programs. As a resoult of the research, other project ideas may appear in the context of our proposal, as in the form of a joint civil partnership our research may highlight that innovative, individual services are needed to improve the economic situation of the region and to reduce the effects of social exclusion.

**Keywords:** Labour Market, Poorly Educated Job Seekers, Best Practices, Increasing Employment Figures.

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#### JEL Classification: R10

#### 1. Introduction

The Hungary-Slovakia border region comprises large agglomerations (Budapest, Bratislava), cities with national and regional importance (i.e., GyőMr, Miskolc, Košice, etc.) and also a wide area of rural country side. It offers a basis for a wide range of economic and social activities and is very heterogeneous from an economic, social and cultural point of view.(Poór, 2014) The agglomerations of Budapest and Bratislava are modern, dynamic, corecentres with a great potential for future development; on the other hand, mostly along the central mountainous and the eastern parts of the border region, there are huge disparities. These areas are characterised by a high unemploymen trate, in some cases significantly higher than the respective national average. (www.vati.hu, 2018)

In this research our aim was to highlight the different labour market issues related to the jobseekers with disadvantages, based on an empirical research in the microregion of Balassagyarmat, Salgótarján in Hungary and Losonc, Rimavska Sobota in Slovakia.

In terms of reaching the Strategy 2020 targets, most countries in the EU continue making modest improvements closing up on the 2008 precrisis indicator levels. Employment recovery in Slovakia and in Hungary follows in its main features, territorial employment development. The EU labour market was finally catching up with the pre-crisis employment level, in 2015 the EU average employment rate reached 70% in Slovakia and 71% in Hungary compared to the 2008 employment rate of 70.3%, and 70.6% in Hungary.(Hungarian National Employment Office, 2018; Slovakian National Employment Agency, 2018)

Due to various factors - geographic location, sex, age, ability and citizenship; for instance - some groups find themselves facing distinct disadvantages. These conditions may be lifelong, such as one's ethnicity, or they may change throughout the life cycle, such as age.Peoplearedefinedas 'non-employed' or 'not in work'



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iftheydidnothave a job and werenotstudyingatthetime. Disadvantaged job seekers have for face with several problems within the society. (Visztenvelt, *et al*, 2014) Obvious potential economic impacts on unemployment poverty and mortgage repossessions may lead to less obvious adverse personal outcomes, including rises in burglaries, divorce, mental illness and childabuse. (Muriel and Sibieta, 2009).

During the research, data was collected with using online questionnaires. 113 responses have been returned from Hungary and Slovakia, but 102 questionnaries were valid, so the sample wich is not representative is 102 organization from the microregions of Balassagyarmat, Salgótarján, Losonc and Rimavska Sobota.

The substantiation of the need of writing and publishing the paper is related to the crossborder cooperation and the innovative projects implementation to support organizations, NGO's with knowledge, practical information concerning different projects, services to support job seekers with disadvantages.

### 2. Research

The border region is a heterogeneous area in terms of its geography, population and settlement structure. Three distinct development poles can be identified in thearea, which are the focal points of the socio-economic development. There is significant migration taking place towards these poles from the rural areas of the border region. The widening gap between the poles and the rural areas is also reflected in the ages tructure of the population. In our research we are focusing on the employment figures, especially the number of the jobseekers in the four microregions.

#### 2.1. Number of unemployed in the four microregion

To summarize the labour market status of the four microregions, we have to examine the number of the unemployed population in the different Hungarian and Slovakian microregions, compared to the population of working age (age between 15-64) in these areas.



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Microregion	Population (person)	Number of the working age population (person)	Number of the unemployed population (person)	Ratio (%)
Balassagyarmat	39.829	28.700	2208	13.1%
Salgótarján	64.504	50.230	6026	8.3 %
Losonc	72.837	59.203	5861	9.9%
RimavskaSobota	83.124	66.877	14.450	21.6%

**Table 1 Unemployment figures** 

Source: Authors analysis based on national statistics (Hungarian National Employment Office, 2018; Slovakian National Employment Agency, 2018)

The high rate of unemployment is stillone of the major problems of the northeastern borderregion in Hungary and in Slovakia as well. The rate is 13.1 % in the microregion of Balassagyarmat, 8.3% in Salgótarján. In Slovakia the situation is almost the same, as the unemployment rate is 9.9% in the microregion of Losonc and very high, 21.6% in Rimavska Sobota.

In our research we were focusing on the different organization's attitude towards the employment of the jobseekers with disadvantages. In this research we have asked our sample about the following groups: romas, career starters, job seekers the age above 45, long term unemlpyed job seekers.

# 2.2. Sample

We have published our online questionnarie in the four different microregions, and we have responses from the following ratio:

Microregion	Number of responses	
Balassagyarmat	26	
Salgótarján	27	
Losonc	25	
RimavskaSobota	24	

Table 2 Samplefromthedifferentmicroregions

Source: Author's analysis, 2018

We have 102 valuable responses all together, but not the same numbers from the different microregions, as we have got 27 questionnarries from the microregion of Salgótarján, 26 from Balassagyarmat, 25 from Losonc and 24 from



RimavskaSobota, wichmens that we had to work with 53 Hungarian and 49 Slovakian responses.

The organizations 85.7% are operating in the private sector, and only 14.3% of the responses come from the public sector. With respect to the distribution of organizations in the industry, we have got the following figures:



Figure 3 Sample by sector (%) n=102 Source: Author's analysis, 2018

The most responses we have realized were came from the sector of services from both countries. The ratio of the industry sector was 26.7%, and the ratio of the agriculture was low, only 6.7% in our sample.

We have examined the number of the employees within the organizations, as this characteristic may have a core function considering to our research. Within the sample, the organizations by the different size have appeared closely equal, except the size with 21-50 employee. We had the following companies based on the size of them.



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Figure 2 Sample by size (%) n=102 Source: Author's analysis, 2018

As within the population of the disadvantaged job seekers the number of the public employment is generally high in both countries, we have asked the organizations concerning the common practice of this topic. We found, that in both counties, the number of employed workers though public employment is relatively high, as it was 40% (44% Slovakia, 56% Hungary). This resoult is important as the method of public employment system is a generally accepted active employment policy tool.

# 2.3. Resoults

As the aim of the research was to ensure answers related the different organization's attitude towards disadvantaged job seekers, we have asked the sample wheter they employ this group or not. We got the following answers:



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Two third of the respondents claimed that there is no difference between the disadvantaged job seekers and the average job seekers based on their performance in the job. No one gave the answer that the organization would not employ a job seeker with disadvantages, but 20% of the respondents choose that they had inconvenient experience with a certain group, wich had an impact on the attitude of employment. A few person, 6.7% from the sample said, that they have no experience in working together with a disadvantaged job seeker.

In our research we wanted to see the possible problems, so we have asked those who claimed that they had certain inconveniences. These respondents highlighted that the group of long term unemployed population has no motivation to reintegrate to the labour market, and this group has no adequate knowledge, their skills are often poor. The group of career starters has no working experience, and their expectations are often irrealistic related to the salary and the career opportunities. A few person have signed the roma population as well, and describe them as demotivated and poorly educated group on the labour market.

We were interested in the respondents ideas, thought concerning the possible policies to increase the employment rate of the disadvantaged job seekers. Many of them have clear answers bases on their experience. We got the following results in this topic:



Figure 4 Useful methods (%) n=225 Source: Author's analysis, 2018



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We found it very intresting that the most frequent answer was the adult education, wich system has severe problems in both countries, and nowadays it is said to be controversy by a significant number of research. The second frequent answer to this question was the special, target group oriented, complex projects, wich means some relevant services to the certain groups to support their social inclusion and integration to the legal labour market. The system of the wage subsidy, wich is a passive labour market policy tool is said to be almost as important as the complex projects. With 35 answers the role of the biases are highlighted within this part of our research, and the last topic based on the supporting ideas of the respondents was the obligatory work, wich means that every working age person should have a job irrespective of the labour market, or the social status or other circumstances of the economy.



Figure 5 Work force (%) n=102 Source: Author's analysis, 2018

Some half of the respondents signed that they do not agree with the statement that the disadvantaged job seekers are less effective employees. One third of the sample said that it can happen, so they partly agree with that, and only 18 person claimed that this statement is true, as the disadvantaged jobseekers are less productive, less effective work force on the labour market.



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Figure6 Integration- time (%) n=102 Source: Author's analysis, 2018

Related to the orientation and the job integration procedure, we were interested in the attitude of the collagues as well. We have found the following ratios:



Figure 7 Integration- procedure (%) n=102 Source: Author's analysis, 2018

As we can read from the table 7. The respondent's opinion is different here, as we got more agreement on the difficulties of the procedure of the integration. All together 42 person agreed on that when a disadvantaged job seeker is entering into an organization, the orientation and the integration programme is more difficult. More than the third of the sample said, that they partly agree with this statement, and only 21 person, wich is 20% said, that this is not a problem, a disadvantaged job seeker's integration into a certain organization has no difference.



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#### 3. Conclusion

Our resoults should considered as the sample of the research was non representative.

Where the employment rate is lower for people in the disadvantagedg roups, compared to others in the population, most of the difference is for people who are inactive. From this empirical research we have found that employers in Slovakia and in Hungary in designated geographical areas have a particular attitude towards disadvantaged jobseeker groups. The respondents emphasised that the adult education and the different, adequate socail projects would help to integrate this population to the labour market. Contraversy to other research, social biases are not discovered, probably because of the common employment projects based on different europian union project's implementation in the boarder area. We suggest to create more and relevant information basis to reduce biases of the empolyers and toimplement projects based on different human services (labour counselling, life long learning guidance, supporting labour market information) to support this sensitive targetgroup.

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DOES SIZE MATTER? DIFFERENT PATHS OF HUNGARIAN ETHNOREGIONAL PARTIES IN NEIGHBOURING STATES

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Smart Communities Workshop, Herlany, 17th – 18th May 2018

### HISTORICAL BACKGROUND



## HUNGARIANS IN NEIGHBOURING COUNTRIES BY CENSUSES (PERSON, %)

	1991	l	2001/2002		2011		2011/1991
Croatia	22 355	0,47	16 595	0,37	14 048	0,33	$\checkmark$
Romania	1 624 959	7,12	1 431 807	6,60	1 227 623	6,10	
Serbia	343 942	3,50	254 544	4,02	253 899	3,53	$\checkmark$
Slovakia	567 296	10,80	520 528	9,70	458 467	8,49	
Slovenia	8 503	0,43	6 243	0,32			
Ukraine			156 566	0,32			<b>\</b> (?)



Zakarpattia (UKR) 151 516 person (2001) regional concentration: 96,8 %

Deva

o Tárqu Jiu

Baia Ma

Дрогоб.
 Болистая.

**Tinutul Secuiesc (ROM)** 609 033person (2011) regional concentration: 49,6 %

Золочів

оТеребовля

"South Slovakia" (SVK) 364 987 person (2011) regional concentration: 79,6 %

Nove Zámk

Szekszár

Pomurska (SLO) 5445 person (2002) regional concentration: 87,2 %

Cosieno

Sanski Most

Source: Kocsis - Tátrai 2012

•ZAGREB

2001

Vojvodina (SRB) 251 136 person (2011) regional concentration: 98,9 %

оИнћи

Szarvas

Obbreo
Haidúszoboszlő

Osijek-Baranja (CRO) 8249 person (2011) regional concentration: 58,7 %

Jajce

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## **RIGHTS OF HUNGARIAN COMMUNITIES**

	use of language	education	preservation of culture	symbols	self- organisation	political represen- tation
Croatia						
Romania						
Serbia						
Slovakia						
Slovenia						
Ukraine						

## MAR-PROJECT, GROUP STATUS OF HUNGARIAN COMMUNITIES

	Political discrimination index	Economic discrimination index	Restrictions on religion	Restrictions on use of language or language instruction
Romania	0	0	1	2
Slovakia	0	2	1	1
Yugoslavia	0	0	0	0
	0 = No dis 4 = Ex	crimination clusion	0 = No re 3 = Activity sha	estriction arply restricted





## LEGISLATION ON ELECTIONS (PARLIAMENT OR THE LOWER CHAMBER)

	General procedure (threshold)	Special procedure for Hungarian community
Croatia	proportional (5%)	guaranteed seat (1) in the National Assembly (proportional, minority constituency)
Romania	proportional (5%)	alternative threshold (20% in 4 constituencies) OR guaranteed seat (1) in the National Assembly (proportional)
Serbia	proportional (5%)	alternative threshold (0,4%)
Slovakia	proportional (5%)	NO
Slovenia	proportional (4%)	guaranteed seat (1) in the National Assembly (majority voting)
Ukraine	mixed: PR (5%) and majority	NO



Parties "referring to the efforts of **geographically concentrated peripheral minorities** which challenge the working order and sometimes even the democratic order of a nation-state by demanding recognition of their cultural identity" *(Müller-Rommel 1998)* 

> ",demands thus calls for the reorganisation of the power structure of the national political system, for a certain degree of self-government for the region. This degree **can vary from cultural protectionism to straightforward separatism**" (De Winter 2001)



### **CLASSIFICATION TRIAL OF HUNGARIAN ETHNOREGIONAL COMMUNITIES 1.**

### **COUNTRIES WITH SMALL COMMUNITIES – SLOVENIA and CROATIA**

<u>Position</u>: small and constantly decreasing population living in a few settlement along the border

<u>Rights</u>: autochthone national communities, comprehensive rights, including guaranteed 1 seat in parliament

#### Currently active parties:

- SLO (1) Hungarian National Autonomous Community of Muravidék
- CRO (2) Democratic Union of Hungarians of Croatia Union of Hungarian Communities

<u>Targets</u>: development and improvement of guaranteed rights and cultural autonomy



### **CLASSIFICATION TRIAL OF HUNGARIAN ETHNOREGIONAL COMMUNITIES 2.**

### **COUNTRIES WITH MULTI-ETHNIC REGIONS – SERBIA and UKRAINE**

<u>Position</u>: relative large, but decreasing, geographically compact population living along the borders within a multi-ethnic region with more or less autonomous traditions

### Currently active parties:

- SRB (4) Alliance of Vojvodina Hungarians Democratic Fellowship of Vojvodina Hungarians Hungarian Movement for Autonomy Hungarian Unity Party
- UKR (2) Transcarpathian Hungarian Cultural Association Democratic Alliance of Hungarians in Ukraine

<u>Targets</u>: autonomous Hungarian district within a territorial autonomy



### Classification trial of Hungarian ethnoregional communities $\mathbf{2}_{\bullet}$

### SERBIA

- asymmetric system with two autonomous regions (Vojvodina, Kosovo) (1974–1988) (2002/2006–onward)
- Autonomous Province of Vojvodina multi-ethnic region (66,8% Serb, 13% Hungarian, 2,6% Slovak, 2,4% Croat, 2,2% Roma, 1,3% Romanian)
- development of three-level autonomy

   Autonomous Province of Vojvodina
   Southern Hungarian Autonomy or Hungarian Autonomous District
   cultural autonomy
- Difficulty: the case of Kosovo (2008)

### UKRAINE

- asymmetric unitary system with an autonomous region (Crimea)
   (1991. referendum)
   (1991–2014)
- Zakarpattia region multi-ethnic region (80% Ukrainian {or Rusyn?}, 12% Hungarian, 2,6% Romanian, 2,5% Russian, 1,1% Roma)
- development of two-level autonomy

   Zakarpattia region (federal or regionalised state)
   any form of self-governance, eg. Hungarian Autonomous District of Beherove
- Difficulty: the case of Crimea (2014)



### **CLASSIFICATION TRIAL OF HUNGARIAN ETHNOREGIONAL COMMUNITIES 3.**

### **COUNTRIES WITH LARGE COMMUNITIES – ROMANIA and SLOVAKIA**

<u>Position</u>: significant but decreasing, more or less geographically compact population living in a relative large territory of the country

Currently active parties:

- ROM (3) Democratic Alliance of Hungarians in Romania Hungarian Civic Party Hungarian People's Party of Transylvania
- SVK (3) Party of the Hungarian Community Hungarian Christian Democratic Alliance MOST – HÍD (Bridge)

<u>Targets</u>: development and improvement of guaranteed rights and cultural autonomy, establishment of territorial autonomy



### **CLASSIFICATION TRIAL OF HUNGARIAN ETHNOREGIONAL COMMUNITIES 3.**

#### Romania

- umbrella organization (1989) –
   Democratic Alliance of Hungarians in Romania
- stabile parliamentary representation, government coalition (1996) – rejection of territorial claims
- internal conflicts: Hungarian People's Party of Transylvania (2011), Hungarian Civic Party (2008), vision of a regionalised state with the special status of Szeklerland
- chance: regionalisation (2013) failed
- competition or cooperation?

#### Slovakia

- unification of parties (1998) Party of the Hungarian Coalition
- stabile parliamentary representation, government coalition (1998) – rejection of territorial claims
- chance: regionalisation (1996, 2001) not along ethnic boundaries
- internal conflicts: MOST–HÍD (2009), vision of a multi-ethnic, multicultural state
- loss of parl. representation (PHC)
- back to territorial claims?



## **CONCLUSIONS – DOES SIZE MATTER?**

### Legal basis

Cultural rights: **YES**, but inversely – the smaller the community, the more rights it has Political rights: **YES**, but inversely – the smaller the community, the more rights it has

### <u>Targets</u>

In some degree YES, but the position or traditions have larger significance

### Chances for success

In some degree **YES**, but inversely – the smaller the community, the more chances it has

### Possible reasons

- general fear from granting (more and primarily territorial) rights
   experiences in WE and in CEE
- divided ethnic communities the question of responsibility of Hungarian governments and parties
- political necessity access to governmental position



## **THANK YOU FOR YOUR ATTENTION!**

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Technical University of Košice, Faculty of Economics

# Perception of Social Entrepreneurship among Entrepreneurs in Slovakia

Jozef Bl'anda

# Introduction

## Social entrepreneurship

- is an important tool for development of local areas and solving a number of social problems
- accelerator of social change
- possible significant impact of social entrepreneurship on the country's economic system
- provides a lot of positive effects to the whole society

# Motivation

- Report of European Commission, 2014:
- 1. low awareness / understanding of SE
- 2. weak business models/low investment readiness of SE
- 3. insufficient and inadequate form of funding
- Shrestha (2013), Slavica et al. (2011) and Perič et al. (2015)
  - good awareness about social entrepreneurship among citizens is one of the most important factors that contribute to development of social entrepreneurship

# Goals of the article

 to analyze the position of social entrepreneurship in Slovakia

- to evaluate how is it perceived by entrepreneurs

# Methodology

- personal interviews with entrepreuneurs
- survey was attended by representatives of 20 enterprises
- businesses ranging from 12 to over 13,000 employees
- automotive, transport, electrical, metallurgy, accommodation, food, machinery, catering and so on

• Questions were divided into several parts/groups

1. the overall perception of social entrepreneurship in Slovakia

- perception of social entrepreneurship and their activities, the benefits of social entrepreneurship
- 2. obstacles for individuals to start a social entrepreneurship
  - form of a scaled questionnaire

3. government measures to encourage entrepreneurs to start social entrepreneurship

4. benefits that SE brings to society

# **Research results**

- General perception of social entrepreneurship
- respondents knew what social entrepreneurship is and understood a concept of social entrepreneurship
- only 3 people did not recognize the concept of social entrepreneurship
- respondents think that social entrepreneurs are not sufficiently valued/acknowledged by society
- most respondents think that social enterprises are creating new jobs, but they have not been able to say if they are good employers
- 9 of all respondents would not start social entrepreneurship, 9 respondents did not know and 2 of respondents could start social entrepreneurship.

- Obstacles for individuals to start a social entrepreneurship
  - A higher average means higher importance of obstacle for respondents.

Obstacle	Average	Ranking
Corruption in obtaining government support	5,45	1
Frequent changes or unclear legislation of social entrepreneurship	5,15	2
Fear of debt	5,00	3
Social entrepreneurship is very time-consuming	5,00	3
Social entrepreneurs face too much of risk	5,00	3
They do not have the right personal qualities	4,90	4
Irregular and uncertain income	4,70	5
Negative opinion on social entrepreneurship by the society	4,55	6

Source: Own processing

- Measures to encourage entrepreneurs to start social entrepreneurship
  - to promote concrete examples as social business helps solve social problems
  - to raise public awareness on social entrepreneurship (regular reports on the activities of social enterprises, reliable statistical data of social entrepreneurship and so on)
  - incorporating information on social entrepreneurship into the content of the school curriculum
  - non-financial support for social enterprises (for example tax concessions)
  - involvement of social enterprises in the state action plans for employment and social inclusion

- Overall perception of social entrepreneurship in Slovakia
  - do not care about social entrepreneurship because it is not a priority for them
  - social entrepreneurship is very necessary, but it does not work well and it is unrealistic to do it in a serious form in Slovakia
  - SE is still in development in Slovakia
  - "after some corruption cases in social entrepreneurship
     I do not care about social entrepreneurship"

- well informed
  - what social entrepreneurship is
  - what social entrepreneurs do
  - about government support of social entrepreneurship
- not well informed
  - advantages of social entrepreneurship
  - what kind of people became social entrepreneurs
  - level of employment provided by social entrepreneurs

# **Conclusion and Recommendations**

- social entrepreneurship is nowadays very discussed topic, because of a lot of positive effects it brings
- entrepreneurs know more about social entrepreneurship and also understand the basic concept of entrepreneurship but they thing it does not work well is Slovakia
- to continue with research of social entrepreneurship in the future
- it would be appropriate to focus on other groups, such as students or ordinary people
- it would be possible to evaluate the overall perception of social entrepreneurship in Slovakia by the whole society
- all acquired knowledge could contribute to the improvement of the position of social entrepreneurship in the conditions of the Slovak Republic.

# Thank you for your attention

# Acknowledgements

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# Key Factors of Silicon Valley Cluster's Success and Excellence

## **SMART COMMUNITIES CONFERENCE -**FOR PRACTITIONERS AND SCIENTISTS

doc. Ing. Peter Burger, PhD. 17-18 May 2018 Herl'any, Slovakia

# Location of Silicon Valley within the USA and within California

WASHINGTON

IDAHO

OREGON

MONTANA

WYOMING

MINNESOTA

MISCONSÍN

*IICHIGAN* 

NEW YORK

NORTH CAROLIN

FLORIDA

SOUTH

DELAWARE

MARYLAND

NORTH DAKOTA

SOUTH DAKOTA

Area: 4 801,84 km<sup>2</sup> The population: 3,07 millions The average annual income: 93 707 \$



# Introduction to Silicon Valley

- The term Silicon Valley was used for the first time by entrepreneur Ralph Vaerst
- Later, since 1971 the journalist Don Hoefler started using it. The name Silicon Valley suggested that at that time the region was the home of many companies like Intel or ADM who used silicon to make their chips.
- Almost 60 innovative, technological regions around the whole world use the term 'Silicon' within their name. E.g. Silicon Bog (Ireland), Silicon Glen (Scotland), Silicon Allee (Berlin), Silicon Wadi (Israel), Silicon Island (New York) and Silicon Hills (Texas).
- Majority of these regions have nothing to do with the manufacture of silicon instruments or particles, and the word "Silicon" in their name refers to Silicon Valley as an archetype (pattern, model) of a successful cluster.



# Key actors in Silicon Valley

- Universities (Stanford University in Palo Alto and University of California in Berkeley) and other top quality universities
- Government of the USA, regional and local governments
- Private sektor
- Research centres
- Specialized service providers
- Professional enterprises management



# Top 10 major corporations in Silicon Valley

Top 10 major corporations (by revenue) in Silicon Valley in 2012			Sales (millions USD)	Profit (millions USD)	Profit margin (%)	Market cap. (millions USD)	Founded
1	Apple	Consumer electronics	164 687	41 747	25	415 655	1976
2	Hewlett-Packard	IT services and equipment	118 680	(12886)	-11	46 34 5	1939
3	Intel	Semiconductors	53 341	11 005	21	108 070	1968
4	Google	Web search and advertising	51 379	10737	21	262 985	1998
5	Cisco	Web search and advertising	47 252	9317	20	111 492	1984
6	Oracle	IT services and equipment	37 149	10 570	28	152 343	1977
7	eBay	Online trading community	14071	2610	19	70297	1995
8	Synnex	IT supply chain services	10286	147	1	1378	1980
9	Gilead	Gilead Sciences Therapeutic viral medicines	9 703	2 592	27	74491	1987
10	Applied Materials Semiconductor	Semiconductor manufacturing equipment	8 700	109	1	16177	1969

# Innovation waves in Silicon Valley



#### Source: Engel, 2014, 2015, Hancock, 2015.

## Key industries, innovations and enterprises in Silicon Valley

	Milestone Silicon Valley Innovations	Major industrial sectors and key
1950s	Transistors	Defense Electronics
		Hewlett-Packard, Varian
1960s	Semiconductors, Defense Technology	Semiconductors
		National Semiconductor, Fairchild,
		Intel, AMD
1970s	Integrated Circuit, Graphical User	Biotechnology
	Interface	Genentech, Genencor
1980s	Personal Computers, Workstations,	Personal Computers, Workstations
	Relational Databases, Biotechnology	Apple, Silicon Graphics, Sun
1990s	Network Computing, Packet switching,	Network Computing, Packet Switching
	Internet Search	Cisco Systems, Sun
		Internet
		Netscape, Yahoo, eBay, Google
2000s +	Social media, Web 2.0, sharing	Social Media
	economy, clean tech	Facebook, YouTube
		Sharing Economy
		Uber, Lyft, Air Bnb

#### Source: Engel, 2014, 2015, Hancock, 2015
In Silicon Valley there have emerged and are still emerging new business models with high added value

- E-shop: (eBay, Netscape)
- Ad-supported internet search:(Google,Yahoo)
- Music downloads, streaming:(Apple iTunes)
- Social networks:(Facebook, MySpace)
- Video streaming service, video service: (Netflix)
- Shared economy: Uber, Air Bnb, Lyft

## **Characteristics of Silicon Valley**

- High level of education in Silicon Valley.
  - High level of diversity and tolerance in Silicon Valley.
  - Job positions in sectors with high added value and acceptance the constant need for change and improvement.
  - The largest center of risk capital use in the world.
  - Enormous patent activity the number of patents granted in Silicon Valley is many times higher than in any other location in the USA and the world.
  - High incomes of individuals and households.
  - The ability to quickly recover from the financial crisis and the rapid restarting of the economy due to the structure of the dominant industries in Silicon Valley.

Source: own processing based on the data from United States Census Bureau, 2017

### **Factors of Silicon Valley success**

Culture, adaptability, mobility, but also the concerns – all of that help Silicon Valley keep moving forward

- Frederick Terman's concerns about brain drain Stanford graduates on the east coast of the USA and his reaction.
- Population and Immigration Explosion in Silicon Valley at the right time.
- Own identity of Silicon Valley entrepreneurs.
- USA fear of the Soviet Union and the Silicon Valley ability of to fight this fear.
- High level of resources mobility.
- High mobility of capital.
- High mobility of human resources, knowledge and technology.

### **Factors of Silicon Valley success**

Culture, adaptability, mobility, but also the concerns – all of that help Silicon Valley keep moving forward

- Returns of successful generations of Silicon Valley entrepreneurs and their help to next generations.
- Genius loci the spirit of Silicon Valley.
- A favorable climate featuring informality and creativity.
- Diversity, tolerance and immigrations as well as their role in the development of Silicon Valley.
- The presence of so called ,,weak bonds".
- The constant ability to attract the most talented people.

### **Future and Trends in Silicon Valley**

Key trend of the present and future of Silicon Valley – convergence and interconnection



Source: Silicon Valley Institute for Regional Studies, 2018

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## Thank you for your attention

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## Educational Effectiveness Across Selected Countries

Ing. Darya Dancaková

Department of Banking and Investment

## Why should we invest in education?

Well educated population contributes to:

- Human capital development
- Economic growth
- Unemployment rates decrease
- Poverty reduction
- Individual welfare increase

## An investment in knowledge pays the best interest (Benjamin Franklin)

## Educational expenditures in selected countries



## Measuring Educational Quality

 The Programme For International Student Assessment (PISA) is an international survey developed by OECD which enables to evaluate the quality, equity and efficiency of school systems worldwide

 In 2015 over half a million students, representing 28 million 15-year-olds in 72 countries and economies, took the internationally agreed two-hour test.

#### Map of PISA countries and economies



OECD countries

Partner countries and economies in PISA 2015

## The Programme For International Student Assessment (PISA)

- Evaluation of education systems worldwide
- Measuring the skills and knowledge of 15-year-old students with focus on:
  - Reading literacy
  - Mathematical literacy
  - Science literacy
  - Problem solving
  - Financial literacy

## More spending on education = higher score?



## Educational expenditures and PISA results

Country name	Country	Math	Reading	Science	Educational
Belgium	BF	506.98	498.52	502.00	4,229
Czech Republic	CZ	492,33	487,25	492,83	2,409
Denmark	DK	511,09	499,81	501,94	4,684
Estonia	EE	519,53	519,14	534,19	3,004
Finland	FI	511,08	526,42	530,66	3,919
France	FR	492,92	499,31	494,98	3,540
Netherland	NL	512,25	502,96	508,57	3,284
Ireland	IE	503,72	520,81	502,58	3,534
Lithuania	LT	478,38	472,41	475,41	2,500
Latvia	LV	482,31	487,76	490,23	3,245
Luxemburg	LU	485,77	481,44	482,81	3,000
Hungary	HU	476,83	469,52	476,75	2,707
Germany	DE	505,97	509,1	509,14	2,675
Poland	PL	504,47	505,7	501,44	3,096
Portugal	РТ	491,63	498,13	501,10	3,993
Austria	AT	497,74	484,87	495,04	3,059
Slovak Republic	SK	475,23	452,51	460,77	2,575
Slovenia	SI	509,92	505,22	512,86	3,184
United Kingdom	GB	492,48	497,97	509,22	4,218
Spain	ES	485,84	495,58	492,79	2,641
Sweden	SE	493,92	500,16	493,42	3,680
Italy	IT	489,73	484,76	480,55	2,826
Average		496,37	495,43	497,69	3,273

- OECDs Average 1489,49 points total (math+reading+science)
- The highest level of educational expenditures – Denmark
- The lowest level of educational expenditures – Czech Republic
- The best PISA performance Estonia (1572,86 points total)
- The worst PISA performance Slovakia (1388,51 points total)

## Educational effectiveness across OECD

Country name	Country code	VRS Efficiency	Ranking
Czech Republic	CZ	1	1
Estonia	EE	1	1
Finland	FI	1	1
Germany	DE	1	1
Ireland	IE	0,995133663	2
Netherlands	NL	0,985987335	3
Denmark	DK	0,983754547	4
Slovenia	SI	0,981502512	5
Spain	ES	0,978812973	6
Belgium	BE	0,975843551	7
Poland	PL	0,972739484	8
Lithuania	LT	0,962542346	9
Austria	AT	0,958058245	10
Sweden	SE	0,957543694	11
Italy	IT	0,95614239	12
France	FR	0,955773263	13
United Kingdom	GB	0,955166799	14
Portugal	PT	0,953403032	15
Slovak Republic	SK	0,948861774	16
Hungary	HU	0,939957477	17
Latvia	LV	0,936096368	18
Luxemburg	LU	0,935314994	19
Average		0,969665202	

- The most inefficient country – Luxemburg
- The most efficient countries

   Czech Republic, Estonia,
   Finland, Germany

# Conclusion and recommendations for future research

- The total score achieved in PISA testing doesn't ultimately tend to be higher in countries, which spend more money on education.
- Educational expenditures on GDP cannot be considered as the only indicator of educational effectiveness.
- Additional indicators should be taken into account:
  - Distribution of educational outcomes,
  - Number of pupils per teacher,
  - Number of schooling years,
  - Teacher statutory salaries etc.

Issues of Porter's competitive advantage model form the point of view of a South-Transdanubian small settlement



#### Abaliget Municipality

Duczon Árpád University of Pécs

Gazdálkodástani Doktori Iskola

> 17.05.2018 Herl'any

The decisive factors of the competitiveness of a settlement

#### • Economical factors

- The infrastructure supply
- The state of public utility networks
- The number of economic operators, ability to enforce their interest

#### • Human factors

- The local social care system
- The primary and secondary eduction system
- The quality of the health care system

Absorption capacity of the resources and capital? Activity of the local economic and social operators? Porter's Diamond Model on the level of settlements (1990)

- Supply of resources
- Terms of Demand
- Supporting and related industries
- Corporate strategy, structure and rivalry
- Government



#### Porter's Diamond Model on the level of settlements (1990)

#### • Supply of resources

- physical infrastructure, financial, the intellectual potential of the people living or working in the settlement can be account for human resources
- Terms of Demand
  - Services provided by a settlement can be market-based or social, in a market-based competition, a settlement can gain the same competitive advantage as a classical business enterprise in the provision of services. In the 21st century, settlements in many cases act as market players in a market.
- Supporting and related industries
- Corporate strategy, structure and rivalry
  - If there is no well-defined organizational strategy with realistic goals, then it cannot go through quality development through its activities.
- Government
  - Government policy can affect the competitiveness of a settlement through several factors. They include, among others, tax policy, financial regulation, regulatory environment for competition. The settlements themselves are also legislators, as they have some power in decision-making, which can also have a major impact on the competitiveness of a settlement.
- Coincidence

## The economic situation of the Region

- The developing Western market economies
  - High-level employment
  - High productivity
- Central and Eastern Europen countries
  - The dominance of the Capital city
  - Great differences between regions
    - A few development regions
    - Mostly dominated by underdeveloped regions

## Traffic and Tansportation Infrastructure (Baranya County)

- Closed characteristic of the traffic and transport
  - Motorway towards the capital
  - The absence of south and east-west corridors
- The railway network is defective
- The water-traffic opportunities are not exploited
- The airport is not exploited
- The cycling transport is well counstructed

Human Infrastructure and local labour market (Abaliget Municipality)

- Financial situation of the population
  - The importance of tourism
    - Seasonal works
    - Letting out a part of houses (every 20th family)
  - Taxable incomes per 100 inhabitants is avarege (46.26%)
- Low number of permanent jobs
  - Municipality and its institutions
    - 20-25 people under public employment program
  - Service sector seasonal jobs

## Unemployement indicators (Abaliget Municipality)

- Public work programs the number of registered unemployed has been decreasing
  - 2009: 69 person
  - 2010: 58 person
  - 2011: 66 person
  - 2012: 65 person
  - 2013: 44 person
  - 2014: 35 person
- Career entrant's unemployment rate is higher then the average
  - Local: 12,77%
  - National: 11,13%
- Most of the registered unemployed are not permanently unemployed – seasonal work
  - Local: 36,17%
  - National: 48.25%

## Culture as a cultural industry?

- 2017 Palkonya Cultural Village of Europe
- 2010 Pécs Europen Capital of Culture
- Active cultural life generate demand
- Development potential of tourism
- Priority tourism product types:
  - Healing spa and thermal water
  - Wine tourism
  - Cultural tourism
  - Village tourism
  - Active tourism products

Can the Culture indistry create economic and social wellfare?

# National resources and potential (Abaliget)

- One of the most varied areas of the county
- Unique environmental features
  - Lowland
  - Mountains
  - Sub-Mediterranean climate
- Peripheral position



## National resources and potential

- The most important tourist destination
  - Artifical lakes
  - Cultural, sports and economic events
  - Nationality traditions
  - Abaliget Stalactite cave



## Infrastructural developments

• KEOP-4.1.0/N/14

Modernisation of energy management in the public institutions /30 M Ft/

- DDOP-2.1.1-AB-12
  - "For the Development of Tourist Attractions and Services in Convergence Regions" /150 M Ft/
- DDOP-5.1.4/A-09-2009-0015

 The sewerage network and sewage treatment plant have been completely built /400 M Ft/

## Development of human resources

• EFOP-1.8.2-17-2017

Development of primary health care /110 M Ft/

• EFOP-3.7.3-16-2017

- Experience-centered learning opportunities /80 M Ft/

• EFOP-5.2.2-17-2017

- Transnational cooperation /50 M Ft/

## Summary

#### Regional development opportunities

- Health tourism
- Fishing tourism
- Cycling tourism
- Ecotourism
- Conference and event tourism
- In cooperation with the settlements of the region, Abaliget may become a micro-tourism center.

#### THANK YOU FOR YOUR ATTENTION!





## Rural innovation: smart ideas and good practices from Hungary

Honvári Patrícia

Smart Communities Conference Herlany, 17-18th May 2018



#### **Theoretical background**

- Innovation: technological, intense progression of metropolitan regions not only!
- Spatial innovation (Schumpeter 1939) every newly introduced process or activity, which was not previously typical to that given area can be understood as innovation, if it brings economic or social added value.
- <u>Rural innovation</u>: such novelty in the economic or social life of rural areas, which gives an added value to the quality of life (Mahroum et al 2007)
- Something new, which has a value creation effect in rural spaces do not necessarily connect to product or technological innovation.
- Rural innovation...
  - promotes local development (it is integrated in the local economy),
  - it has an income-generating capacity (development process)
  - it contributes to the well-being of local stakeholders and increases the added value



#### **Theoretical background**

• Innovation capacity of rural areas – not very favourable





#### **Rural innovations**

- Starting point: rural problems, challenges shortage (G. Fekete 2001)
- Despite the disadvantageous environment, many rural communities successfully applied different solutions
- Novelty, aiming to maintain or increase the quality of life
- 3 examples from Hungary rural innovations, smart (?) solutions
  - Alsómocsolád: smart village initiative
  - Nagypáli: "green way program"
  - Megyer: the village to rent (touristic innovation)



## Case study 1: Alsómocsolád, the smart village

- Population: 336
- Since 1990: different developments and improvements
- Role of the local mayor is significant
- student hostel, forest gym park, broadband internet connection, retirement homes, guest house (84 places) and conference centre, overall village renewal...
- Settlement Network of Digital Future: the city of Budaörs and Alsómocsolád village signed an agreement; aim: increase the receptiveness of new technologies, easier administration at the government




### Case study 1: Alsómocsolád, the smart village

- KRTK Regionális Kutatások Intézete
- Digital (smart) village development:
  - touristic mobil applications (hiking trails, nature trails); outdoor fairy tale games for smart phones
  - virtual tour in the village
  - conference center: scientific exhibition, experiments
  - planetarium: lectures, presentation, flight simulator











község, hanem az egész környék is óriási veszélyben van. Könnyedén eltűnhet a föld színéről, ha nem segítetek. Ehhez





## Case study 1: Alsómocsolád, the smart village

- Results:
  - Local community involvement (Municipality of Children and Youth every resident aged 6-30 in the village is a member); Rigac new local currency, issued by the local municipality in 2013 (in the value of 7,5 million HUF ~ 24.000 EUR)
  - Economic development: 4 enterprises, 26 micro-enterprises, 14 active civil organisations
  - Number of active workplaces: 450 (more than the total population)
  - The shrinking of the population could be stopped stagnating









### Case study 2: Nagypáli

- "Wonder village"
- Spectacular development since 1996
- Key actor: mayor (Köcse Tibor)
- Population of the village has almost doubled (from 272 to 502), the average age has become younger
- "Green way program" the village has based its development on the renewable energy sources





### Case study 2: Nagypáli

- First step: "biosolar" heating system for the municipal buildings (mixed energy from solar and biomass)
- Production of biomass (energy willow)
- Establishment of the "Innovation Eco-center" gives space to renewable energy enterprises, and exhibition center
- Development of tourism: health tourism, recreational holiday park, local products, special events (falcon festival, air-balloon festival)
- Active local community life, many civil organisations, several local programs
- Future plans: biogas power plant all households utilizing only renewable energies

### Case study 2: Nagypáli













### Case study 3: Megyer, the village for rent

- Population: 33
- Under the threat of disappearing (country's smallest remaining village), with a very low population, altogether 21 houses, but 5 is occupied.
- 2006: new mayor (external) started to apply for grants and subsidies
- Development way: tourism renting some of the houses to overnight guests (renovation financed by EU grants) – very slow results



## Case study 3: Megyer, the village for rent

#### Idea: rent the "whole" village

for about 670 EUR/day, one can get
control over 7 guest houses, the town
hall, the local stables, the animals, a
classroom, a canteen, the
farmlands...

- Also become deputy mayor, rename the streets
- Major success, many inquiries, national and international media (BBC, Telegraph, NY Times)



#### Egy falu kiadó

Hirdető Megyer. Feladás dátuma február 23. 17:23. Hirdetés kezelése



#### Bérleti díj: 210 000 Ft

Megye: Veszprém

Kategória: Telek, föld, Kiadó Balaton közelében

Telek mérete: 150000 m<sup>2</sup>

Bérelj egy egész falut egy hétvégére! Sümegtől 10 km-re Megyeren 7 teljesen felújított és berendezett falusi házban lakhattok, de tiétek lehet a kultúr, a pajta is, és aki szeretne a közügyekbe is beleszólni 2 napig, abból akár alpolgármester is lehet, így szabadon megváltoztathatja az utcák, terek nevét. Gyertek falura, éljetek vidáman!

## Case study 3: Megyer, the village for rent

۲

### Results:

- Runs as a cooperative (the owners of the cottages as members), giving job to 8 more people
- 4.200 guest nights in a year
- New ideas: weddings, birthday celebrations, corporate training events, costume parties, etc.
- Community involvement: locals are taking part, job opportunities (local products)
- Aim: stable service, giving job to the locals, stable quality of life





#### Conclusion

- All 3 examples can be understood as rural innovations
- Important role of mayor (local hero openminded, high quality educated, committed to change)
- Long, and still ongoing development process
- Innovative idea
- Aminig for self-preservation (local products, boosting local ecomony)
- Ability to build the local sorces in the local development



## Smartness is not always measured in technology and ICT issues...





## Thank you for your attention!

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# Smart Cities and (start-up) communities

Oto Hudec, Marek Lavčák

Technical University of Košice, Faculty of Economics.

## SMART cities related questions

#### • Smart explanation of smart city

• "A **Smart City** is a city seeking to address public issues via ICT-based solutions on the basis of a multi-stakeholder, municipally based partnership" (Mapping Smart Cities in EU, 2015).

#### • SMART PEOPLE in SMART CITIES

- we believe a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance (Caragliu, Del Bo, Nijkamp, 2011).
- Initially: Are creative cities smart cities also start-up cities?
- Is e.g. Vienna full of everything valuable liveable, cultural, creative, organised?
- Slovak (and Czech Republic) cities (less positive attributes)
- Quality of life (subjective well-being) role of GDP size culture density
- Ashoka social innovators networks who is a typical innovator, how dense are their networks?
- Start-up leaders, co-working places typical social innovators
- Start-up communities and ecosystems, what is a difference in post-communist cities?

## Subjective Quality of Life in the European cities

- State of European
   Cities" objective conditions (Urban Audit)
- Survey on perceptions of quality of life in 79 European cities – subjective conditions:
   - in 79 cities, 2007, 2010, 2013, 2016
- Appr. 500 respondents in each city.
- Subjective QoL
- Cluster analysis

Δτορ	variable
Satisfaction with public services	satisfaction with public transport in the city
	satisfaction with health care (doctors and
	hospitals)
	satisfaction with sports facilities
	satisfaction with the convices offices
Satisfaction with cultural facilities	
Satisfaction with eith eight	acticity with the encourage of streats and
Satisfaction with city sight	buildings
	satisfaction with public spaces (plazas,
	pedestrian zones,)
Satisfaction with the availability of green spaces	satisfaction with accessibility of green parks and
and recreational opportunities	gardens
	satisfaction with recreational facilities outside the
	city (hiking, cycling,)
Jobs	
availability of housing	
credibility people	
The rate of environmental pollution	air pollution
	level of noise
cleanliness of city	
health	
Fighting climate change	combating climate change
	responsible use of resources
Feeling safe in the city	
The problem of poverty	existence of the problem of poverty
	paying accounts problems
Integration of foreigners	positive impact on foreigners
	insufficient integration of foreigners

### **Hierarchical clustering**





#### Type 1 (10 cities): Paris, London, Prague, Kobenhavn, Stockholm, Munich, Malmö, Amsterdam, Helsinki, Luxemburg.

Strenghts	Evaluation	Problems	Evaluation
Jobs	+++	Accommodation accessibility	
Cultural possibilities	+++		
Green and recreational opportunities	+++	Ĩ	
Appearance of the city	++		
Level of public services	++		
Combating climate change	++		
Credibility population	++		
Health	++		
Cleanliness	++		
Safety	++		
Poverty	+		
Integration of foreigners	+		

## Type 5 (8 cities): Tallinn, Zagreb, Vilnius, Košice, Riga, Miskolc, Dublin, Istanbul – on the margin of EU

Strenghts	Evaluation	Problems	Evaluation
Level of public services	++	Jobs	
Cultural possibilities	++	Poverty	
Appearance of the city	++	Environment	-
Cleanliness	++	Combating climate change	-
Green and recreational opportunities	++		
Integration of foreigners	++		
Health	++		

#### Type 8 (3 cities): Naples, Palermo, Athens

Only culture remains positive...

Strenghts	Evaluation	Problems	Evaluation
Cultural possibilities	++	Accommodation accessibility	
		Combating climate change	
		Environment	
		Jobs	
		Cleanliness	
		Green and recreational opportunities	
		Level of public services	
		Poverty	
		Appearance of the city	-





#### "Objective" well-being – explanatory factors: GDP matters



GDP per capita PPP (in thous.)

#### Cluster type and population – no significant association



Population

## Too high population density makes well-being worse at the end



Population density (population per km<sup>2</sup>)

#### Research questions: start-up communities

- Which city factors are significant in process of **creation**, **evolution** and **operation** of start-up ecosystem community?
- What attributes are specific for start-up ecosystems in **postcommunistic countries**?

#### What we mean by start-up

- Company in early stage (usually first 5 years),
- Provides **highly innovative product**, developed in intensive communication with potential customers,
- Extreme growth potential (weekly even more 5-7%) and global ambitions,
- Scalable and repeatable business model,
- Limited financial resources, **external forms of capital** especially during early stage,
- International network and public recognition,
- Active membership in the local (or national) ecosystem.

#### Methodology

- Empirical research: interviews with
  - $\circ$  startup entrepreneurs and freelancers,
  - o incubator team members,
  - o accelerator team members,
  - o startup supporters,
  - o institutional investors and venture capitalists,
  - o university science park team members.

#### Start-up ecosystem attributes

- Leadership: who is the committed captain in the ecosystem?
- Entrepreneurial culture: emphasis on entrepreneurship to create and exploit efficiently new opportunities
- Duality in the ecosystem: large firms provide market access for startups,
- Formal institutions: extensive university, corporate research centres, clusters, government involvement
- **Community heartbeat and engagement:** social capital, large number of visible events,
- Support services and business infrastructure (mentors, advisors, visible investors law and accounting firms, mentors, co-working places, incubators, accelerators, etc.)
- **Competition and inclusiveness**: Highly competitive industries, reasonable balance between open innovation and Intellectual property protection,
- Mobility: high mobility of the ecosystem participants, talent attractiveness,
- **City and places:** unique factors of the city or place for start-up community.

and phase, city size, institutional structure, No of start-ups, European funds, etc.



#### Structure (local institutions involved), amount (no of registered startups)

#### Startup ecosystems – nature and functioning



#### Interview results – ecosystem attributes

Factor	Prague, Bratislava	Brno, Žilina	Ostrava, Košice
Leadership	Led by private companies	Led by public institution (university, JIC)	Led by NGO's
Entrepreneurial culture	Fashion, bottom up, competition, global connections	Institutions dominate	ICT and technology led + CI, cooperative
Duality in the ecosystem	Exist	Does not exist	Partial
Community heartbeat and engagement	3-4 centres	Limited to get in	One community, strong social capital
Support services and business	High numbers of mentors, advisors and incubators	low number of local mentors, infrastructure built	low number of local mentors, infrastructure built
Competition and inclusiveness	Very competitive, exclusive clubs	competitive, closed	Cooperation, open
EU funds	Limited	EU finance – 15 years well working	EU finance – not yet well utilised
Types	Firms centered	Institutions centered	Personalities and networks centered

**Building Partnership** 



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European Regional Development Fund

## Smart Communities in a Global Context Tendencies and Challenges

Viktoria JOZSA, PhD

Smart Communities Conference Herl'any, Slovakia 17-18 May 2018





















## **SMART** COMMUNITIES

Virtual Education and RDI Network in the Slovakian - Hungarian border region (SKHU/1601/4.1/210)

## Megatrends







## **Smart Cities** & Communities

## Demographic Changes





Source: Emil BOC, Mayor of Cluj-Napoca City, Smart City CEE conference, 2018





















## ECO system

instead of

## EGO system



Source: Emil BOC, Mayor of Cluj-Napoca City, Smart City CEE conference, 2018





















## Robots take over:

Machine to run for MAYOR in Japan pledging 'fair opportunities for all'

A ROBOT has been nominated to run for Mayor of Tokyo in a world first that see the machine promising to be "fair and balanced" to all its constituents in a major breakthrough for Artificial Intelligence (AI).



Source: www.express.co.uk/news/world/947448/robots-japan-tokyo-mayor-artificial-intelligence-ai-news





















3.

Integrated but tailor-made approach



Source: Emil BOC, Mayor of Cluj-Napoca City, Smart City CEE conference, 2018









Source: Amsterdam Smart City, Frans-Anton Vermast, Smart City CEE conference, 2018




















5.

Holistic approach from buzzwords to keywords

Trust **Cross Silo** Citizens Engagement Open Facilitator Leadership End-user centric Uncertainty/Failure



















#### Interreg **Global Tendencies in ,Smartness' Slovakia-Hungary Building Partnership** trengthe celera 6. Sustainable **Social** Open amsterdam smart amsterdam Governments Residents Cities netto smart er city Knowledge institutions Citizens ntern 4H model















## Data is for the Citizens

## Data Disclosed



X DataLab X Amsterdam

https://tada.city/en/

Three layers:

Shared Internal

6 Principles: Inclusive Controlled Tailored to People Legitimate and Monitored Open and Transparent From Everyone For Everyone

Interreg

Slovakia-Hungary

**Building Partnership** 





















Source: Digital Greenwich Initiative, Paul Copping, Smart City CEE conference, 2018





















#### A solar panel for every citizen!

economic 87-SPJ-4 E-Smart growth (850,000 pieces) Eerste Helmersstraat 104 Address 1054 Amsterdan 010 and social cohesion



#### Cooperation with e-mobility & flexible cars

Source: Amsterdam Smart City, Frans-Anton Vermast, Smart City CEE conference, 2018



Balance





















# We learn from failures!

Focus on local residents!

No subsidies!

Economic viability is key!

Not the whole city is a living lab!

1 out of 7 ideas succeed!

Partnership and clear leadership!



















Talk the TalkvsWalk the Walk10.

# Age of Plans vs Age of Action



Story 1



Big Data is like *teenage sex*:

- everyone talks about it
- nobody really knows how to do it
- everyone thinks everyone else is doing it
- so everyone claims they are doing it

Dan Ariely, Duke University Director of the Center for Advanced Hindsight



Story 2



## How many employees will be in the Factory of the Future?





## Smart Communities Project







Just over one quarter (28.0 %) of the EU-28 population lived in a rural area in 2015 those living in **towns and suburbs (31.6 %)**, the biggest share of the EU-28 population lived in **cities (40.4 %)**.

During the five-year period from 2010 to 2015, there was a **gradual increase** in the number of people living in **rural areas** across the EU-28 (1.7% increase); the increase in the share of the population living in towns and suburbs was even greater (4.7%), the share of people living in **cities declined** at a relatively rapid pace.

These **patterns** possibly reflect Europeans leaving inner city areas in search of more (affordable) space, in suburbia, towns, or the countryside.

Among people **aged 30 to 34**, just over one quarter (**27.9** %) of the EU-28 population that was living in a rural area had **a tertiary level of educational attainment** in 2015; this share rose to one third (**33.4** %) for people living in **towns or suburbs**, and peaked at almost half (**48.1** %) among those living in **cities**.



















#### **Basic idea:**

#### Is smartness the privilege of cities?

Our **objective** is to present **a new conceptual approach** towards "Smart City" **concept and a pilot application** focusing on smart rural communities in cross-border environment.

#### **PROOF OF CONCEPT?**

Research generally focuses on **mid-size and large cities**\* and discover several aspects of smartness that are connected to size, number of inhabitants, functions and large scale infrastructure as prerequisites. Critical literature is recent and relatively rare\*\*.

\* Bakici et al. 2013; Paskaleva 2011; Rat-Fischer et al. 2012; Allwinkle-Cruickshank 2011; Caragliu et al. 2011 \*\* Hollands 2008; Vanolo 2014, Townsend 2013





#### **Citizen-based Approach**

we examine the concept of smartness from a yet understudied perspective that is the characteristics and opportunities of **small rural communities**, and

the presented new conceptual model and its pilot application in a **cross-border environment** in convergence areas of the European Union.

**Conceptualisation and operationalisation** of the 'Smart City' concept in case of small rural communities in a real-time cross-border environment are **original contributions** to the state of the art.



We are building on **two main tendencies** 

- **1. Rural areas**: attitude and mindset change from agricultural and less developed to **liveable, healthy and innovative** character, the availability of internet and ICT tools.
- **2. Global processes**: Web 2.0, Globalisation 3.0, Industry 4.0, IoT, digitalisation where technologically literate workers are the most important assets.
  - flexible employment solutions could outperform 'traditional' workplaces, provide more equal opportunities for marginalised groups, 'smart' citizenship;
  - need for intervention at local level
    - to create the connection between ICT and local society and
    - to raise higher awareness towards (self)-sustainable living style.















#### **,The Periphery of the Periphery'**





The geographical focus of the project is a disadvantaged area in Slovak–Hungarian border the **region** (test environment) with continuously worsening economic and social county and microregional level indicators (eg.: GDP, (un)employment, migration, shrinking communities, inefficient use of natural resources, low education level and value-added, ...) despite former, traditional rural development interventions.



#### **Connection Point 4**



#### SMART CITIZENS

there is a **need** for As attitude change, the primary target group of the model is the young generation starting from early childhood, the primary school or the kindergarten.

INFORMATION COMMUNICATION TECHNOLOGY SECTOR SELF-SUSTAINABLE LIFESTYLE FOCUS **Development of ,soft' elements** Institutionalisation Train the Trainers Virtual E&R&D&I Network School Clubs Smart ICT Competence Center Summer Camps Sustainable Living Lab ACTION Local Bloom Movement Smart Communities Academia Motivation and Career days Service Development Life Career Models Smart Pilot Project Development

















#### 1. Citizen Engagement (Development of ,soft' elements)





#### 2. Institutionalisation





#### Impact assessment



Main long-term impacts for the area:

- increased integration into global tendencies;
- strengthened consciousness, alternative options (life career models);
- openness towards new technologies and global trends;
- higher value-added and critical mass of intellectual resources;
- increased **reputation and visibility** and higher attractivity to all kind of investment innovative 'smart' interventions for cross-border development.
- Main **mid-term results** for the disadvantaged target group :
- increased employment and employability;
- advanced environment for sustainable (distance) employment;
- positive **attitude** change, strengthened consciousness and life-style;
- increased networking, internationalisation, community development.

















#### **Conclusion and future directions**



- 'Smartness' is not the privilege of cities and alternative concept models should be developed and tested for small rural communities, focusing on investment in 'soft' elements with a citizen-based approach.
- Matchmaking between local specifics and global tendencies could be managed in a cross-border environment.
- Focus on higher local level resiliency, intellectual capital and attitude change from the childhood could result higher employability in the mid-term and thus, more sustainable and 'smarter' citizens and rural communities.
- Directions for further research with an applied character are the **widening of the geographical and the sectoral scope** to other areas and elements of 'smartness'.



#### **School Clubs**











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European Regional Development Fund

## **THANK YOU FOR YOUR ATTENTION!**



The project is co-financed by the European Regional Development Fund.





Co-funded by the Erasmus+ Programme of the European Union

# Education for Local Development of Rural Areas - ELDORA

HENRIETA KIRAĽVARGOVÁ,

AGENTÚRA NA PODPORU REGIONÁLNEHO ROZVOJA KOŠICE, N.O.

HERĽANY, 17.05.2018



## Basic information

Programme: Erasmus+

Key Action: Cooperation for innovation and the exchange of good practices

Action: Strategic Partnerships (field Strategic Partnerships for vocational education and training)

Main objective of the project: **Development of Innovation** 

Project Title: Education for Local Development of Rural Areas

Project Acronym: **ELDORA** 

Project number: 2017-1-SK01-KA202-035388



Co-funded by the Erasmus+ Programme of the European Union



## **R**ARR



Agency for the Support of Regional Development Košice, non profit organisation

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BORA 94 BORSOD-ABAÚJ-ZEMPLÉN MEGYEI FEJLESZTÉSI ÜGYNÖKSÉG





## Problems / needs / context

Slovakia - Hungary - Poland - Italy .... Some similar problems:

- high unemployment rate vs. lack of qualified people
- long-term unemployment; young people unemployment
- brain drain
- depopulation

... Youth (under 25s) unemployment rate in December 2016: Italy 40,1 %, Slovakia 20,4 %, Poland 17,5 %, Hungary 11,9 %...



The "social economy" employs over 11 million people in the EU, accounting for 6% of total employment.

BUT:

Social economy has very low share on overall employment in regions of Central Europe (PL,SK,HU).

Conclusion:

Education in this field is **necessary** as basis for activities of municipalities, NGOs and other relevant stakeholders.



## What is a social enterprise?

A social enterprise is an operator in the social economy whose main objective is to have a social impact rather than make a profit for its owners or shareholders.

It operates by providing goods and services for the market in an entrepreneurial and innovative way and uses its profit primarily to achieve social objectives.

It is managed in an open and responsible manner and, in particular, involves employees, consumers and stakeholders affected by its commercial activities.



## What can we do?

Provide knowledge, experiences, competences Promote idea (philosophy) of social entrepreneurship Identify and promote available good examples Collect information and spread it further



## Target groups

• Young people at their final year at schools

• Organisations (schools) dealing with trainings and dissemination of information in the field of local and regional development in the rural regions and

- Groups active in municipalities and micro regions
- Local leaders, mayors, other local government employees
- Small and medium-size entrepreneurs
- Non-governmental organisations

The most important indirect beneficiaries are unemployed from risk groups, especially young unemployed people.



## The aim of the project

to strengthen the key competences and skills of young people at their final year at schools, unemployed young people and leaders in rural areas to help them **start a social enterprise** in order to better utilize local natural and human resources, to increase economic development of rural areas and to prevent brain drain.

# Project activities



## Intellectual outputs

101

- A Handbook How to Establish and Manage Social Enterprises
- B Best practices collection

102

- A Teaching plan and teaching material for training series
- B E-learning videos

IO3 Game – mobile application

## IO1 Handbook *How to Establish and Manage* Social Enterprises + best practices collection

The aim of this intellectual output is to develop a publication about social entrepreneurship.

Handbook together with collection of best practices will be used by managers and (potential) social entrepreneurs who do not want, or are not able to participate in training series organised by some VET institution.

Handbook will provide necessary information, what "not to forget" when establishing and managing social enterprise.
# IO2 Teaching plan and teaching materia for training series and e-learning videos

Curricula for training series "Social entrepreneurship - Local development driven by utilisation of local sources". The plan will give the outline of the training series.

The project partners will also develop educational video about local sources and its impact to economy of communities, which will be used for education and consulting.

-  $5 \times 4$  educational and motivating video with subtitles



# IO3 Game – Mobile application

Game – mobile application creation is an innovative activity, which is aimed to increase motivation, but also for easier process of education of young people.

By developing a game on social entrepreneurship and utilising it in schools young people will be supported in acquisition of skills and attitudes to start and run a social enterprise.



# Learning/Teaching/Training Activities

### **1. Short-term joint staff training events**

Training of project partner's staff from Slovakia, Hungary and Poland => Italy

This training will focus on visiting functional examples of social enterprises and talking to successful managers in Italy.

#### 2. Short-term joint staff training events

Trainings for trainers: 2 two-day trainings series for Slovakian, Hungarian and Polish project partner members

Skilled trainers will provide knowledge in the area of good training leading, how to consult, how to motivate trainees, innovative approach to training process, etc



# Multiplier event and dissemination

Information events presenting intellectual outputs in all involved countries.

Invited groups: potential trainers, stakeholders active in the area of local sources utilisation, local and regional municipalities, NGOs, volunteers

Dissemination activities: seminar, meeting, conference, article in newspaper /magazine/newsletters, TV, radio spot, article on website ...



# Thank you for your attention!

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Technology Context for Resilient City -Case of Košice on the Tourism Map

> Koľveková, Gabriela Liptáková, Erika

Faculty of Economics Technical University of Košice, Slovakia



### **Introduction** The city of Košice – main facts:

- Economic hub of Eastern Slovakia.
- ▶ It accounts for about 9% of the Slovak GDP.
- Concentration of IT companies raises IT Valley of Košice.
- Located 20 km from Hungarian border.
- > 240 000 inhabitants with density of 1 008 inhabitants per km<sup>2</sup>.
- Surrounded by beautiful nature.
- Has history worth exploring.

Attracting of tourists to the city could bring significant external income to the local economy

### Introduction Smart cities:

- Are able to detect a wide range of data:
- about individuals' behaviours,
- coming from different sensors,
- letting us to identify population at risk,
- monitor daily life activities of identified users in a smart environment,
- provide personalized interventions.
- Application of technologies in city management.
- Using big data in mapping the routs and preferences of tourist could help the city marketers to evaluate their marketing policies.
- Mobile applications are an excellent opportunity to reach the target groups of tourists.

### The Scope of Research To find out:

- which attractions/places in Košice and its surroundings are visited by foreign students,
- how often these visitors pay a visit to the attraction/place,
- how much time they spent there,
- which means of transport do they use,
- which routes they take and so on...

### ... and also the information on:

- motivation to visit the attraction/place,
- foreign students' notes on visited attraction/place,
- feelings feedback (by using a scale).

### Data collection

Surveys carried out from March to June 2017.

Respondents (tourists) were foreign students from Erasmus programme -15 students in the age of 18-25 from Spain, Poland, Turkey and Moldova.

Instruction to the students:

- Download an app for smartphone. Use that application to measure the whole rout whenever she/he walked out of dormitory or school every day and weekends as well.
- Gather own data during minimum of 3 weeks or more.
- Make notes on visited places. Provide her/his feelings feedback by using a scale.

### Results

- Quantitative analysis consists of evaluation of the data obtained from the mobile app (Figure 1, 2).
- Qualitative analysis uses profile of a tourist, information on motivation to visit the destination/attraction and assessment of the place visited using scale The Personal Involvement Inventory (Table 1).

INTERREG - LOCAL AND COMMUNITY DEVELOPMENT BUILDING SMART COMMUNITIES Herlany, 17th May 2018



Figure 1: Output from mobile app (obtained from Spanish student – visit of Lake in Košice)

6

Figure 2: Output from mobile app (obtained from student from Poland – visit of ZOO Košice)



7

INTERREG - LOCAL AND COMMUNITY DEVELOPMENT BUILDING SMART COMMUNITIES Herlany, 17th May 2018 Table 1. Example - Assessment form of the Lake in Košice, place visited on May 22<sup>nd</sup>, 2017 by tourist from SpainSource: own survey – used scale by Zaichowsky, 1985

Range boundry	Assessment				Range boundry			
Important		×						Unimportant
Of no concern						×		Of concern to me
Irrelevant						×		Relevant
Means a lot to me			×					Means nothing to me
Useless						×		Useful
Valuable		×						Worthless
Trivial				×				Fundamental
Beneficial		×						Not beneficial
Matters to me		×						Does not matter
Uninterested						×		Interested
Significant		×						Insignificant
Vital			×					Superfluous
boring							×	Interesting
Unexciting					×			Exciting
Appealing		×						Unappealing
Mundane					×			Fascinating
essential			×					Nonessential
Undesirable					×			Desirable
Wanted			×					Unwanted
Not needed						×		needed

INTERREG - LOCAL AND COMMUNITY DEVELOPMENT

BUILDING SMART COMMUNITIES Herlany, 17th May 2018

### **Discussion and conclusions**

- One of the main findings of tourism effects in Input-output analysis by Sweedish authors (Kronenberg et al., 2018) was that this industry's consumption was still increasing while the rest of the industries were in sectoral recession.
- This makes theorist to believe that investing peoples' skills, time and money into tourism sector can substantially help region to be resilient.
- The contribution of the paper is in an example how and which data to collect.
- We recommend to use mobile application for collecting data on attractions/places in terms of involvement construct - in order to find out if they really are attractive or to what extent they are attractive.
- Our study has shown how rich could be the data received using mobile application in combination with qualitative research.

# Illustration of students assessment of ZOO and Lake in Košice

- "I have visited the ZOO of Košice with some friends. We wanted to see the variety of animals, and to have a great day. Both the size of the zoo and the variety of different animals seemed to be quite big. We had a lot of fun, and we saw many different species of animals, as well as discovered unseen ones. I haven't been to many zoos in my life, but this one seemed to be nice and well-groomed. Using a Hosany scale: I feel enthusiasm, joy, love. I feel warm-hearted there." (Ilona, Poland)
- "Lake is like escaping place for me. I did run picnic, walking there. It is really nice to have that kind of natural places to escape from the city." (Izmir, Turkey)

### Acknowledgement

Paper is a part of project findings, the project is: VEGA 1/0961/16 -"Economic Implications and Perspectives of the Participation of Slovak Republic in the Process of Production Activities Fragmentation within Global Value Chains".



### Cross-border Cooperation Programme – Analysis of the ENPI CBC HU-SK-RO-UA 2007-2013

17.5.2018 Herľany, Slovakia

## **Content of the presentation**

- ENPI CBC HU-SK-RO-UA Programme
- Methodology
- Analysis of received and rejected applications
- Analysis of the funding and main implementation problems
- Partnership and involved organizations
- Recommendation for the ENI CBC HU-SK-RO-UA

### **Programme ENPI CBC HU-SK-RO-UA**

• Programme period 2007-2013 - Allocation 68 million EUR

The programme's overall objective was to intensify and deepen cooperation in an environmentally, socially and economically sustainable way between Zakarpatska, Ivano-Frankivska and Chernivetska regions of Ukraine and eligible and adjacent areas of Hungary, Romania and Slovakia.

- The programme was implemented under 4 priorities, which were:
- Priority 1: Promote economic and social development
- Priority 2: Enhance environmental quality
- Priority 3: Increase border efficiency
- Priority 4: Support people to people cooperation

### Methodology

The basis for the presentation is a case study focusing on the evaluation of the ENPI CBC HU-SK-RO-UA Programme..

The methodology for the evaluation of EU programme's, especially of ENPI CBC Programmes was used in case study.

Quantitative data for programme and each project was obtained from the JTS

Interview with programme stakeholders – qualitative analysis

# Analysis of received and rejected applications

Analysis of received and approved applications in Programme ENPI CBC HU-SK-RO-UA 2007-2013										
Number of Applications	Received	%	Rejected	%	r Appro	Von ved	k	Approve	d	*
Programme	679	100%	72	11%	i	472 7	70%	13	5 20	/%
ENPIHU-SK-RO-UA	199%		100%		10	)0%		100	6	
Defendend	167	100%	20	12%		116 6	59%	3	1 19	1%
Priority 1	25%		28%		2	25%		239	6	
Driosity 2	144	100%	15	10%		102 7	71%	2	7 19	/%
Priority 2	21%		21%		2	2%		20	6	
Priority 4	368	100%	37	10%		254 6	59%	( 7	7 21	.%
	54%		51%		5	64%		57	/	
	237	100%	26	11%		177 7	75%	3	4 14	1%
WedSure 4.1	35%		36%		3	8%		259	6	
Moncure 4.2	131	100%	11	8%		77 5	59%	4	3 33	<b>%</b>
WedSure 4.2	, 19%		15%		1	6%		325	6	
Priority <sup>1</sup>	Allocation (thousand EUR)		Requested (thousand EUR)		%	Approved (thousand EUR)		oved nd EUR)	%	
Priority 1	10 29	6	51 73	51 733		10 655		555	103%	
Priority 2	17 160		95 73	95 731		17 652		552	103%	
Priority 4	13 728		90 10	2	656%	14 430		130	105%	
Measure 4.1	10 296		78 48	78 483		10 803		303	105%	
Measure 4.2	3 432		11 61	11 619		3 627		27	106%	
Total	41 184		237 566		577%	42 737		37	104%	
<sup>1</sup> without TA and Pri	ority 3									

# The total disbursement of the ERDF grant

Priority1	Approved (thousand EUR)	Disbursement (thousand EUR)	%
Priority 1	10 655	9 397	88%
Priority 2	17 652	15 553	88%
Priority 4	14 430	12 407	86%
Measure 4.1	10 803	9 131	85%
Measure 4.2	3 627	3 275	90%
TOTAL	42 737	37 357	87%
<sup>1</sup> without TA and priority 3			

Disbursement of the ERDF per programme and per each priority

Disbursement of the ERDF per Country in Priority 4	Disbursement per country	Approved	Disbursement	% of Disbursement	Number of projects
	Priority 4	14 429 761 €	12 406 785 €	86%	77
	Hungary	3 524 024 €	3 141 773 €	89%	46
	Slovakia	2 026 730 €	1757 226€	87%	31
	Romania	2 612 336 €	<u>2 293 636</u> €	88%	35
	Ukraine	6 266 672€	5 214 150 €	83%	77

## **Main Implementation problems**

#### Political situation in Ukraine - war

- The non-profit and the public sector were affected
- bankrupt of several banks

#### **Exchange rate differences**

- Project preparation (1 EUR= 15 UAH)
- Project implementation (1 EUR= 47 UAH)

**Problems with financial management – Project cash flow** 

**Project Time plan and Budget modifications** 

**Coordination of the higher number of partners and different Legislation of member states** 

National controls for expenditure verification realized under the Ministries of the member state countries

## Partnership and Involved organization

Organization break down according to th analysis

Only projects from priority 4



## Partnership and Involved organization

Organization break down according to the analysis

Disbursement	NGO	RLA	UHS	HOSP	CBSA	OTHER	TOTAL
according to the types of institutions	£	€	€	€	€	€	€
Priority 4	7 734 899	1 103 084	1 036 158	825 322	1 146 334	560 989	12 406 785
Hungary	1 930 288	194 456	80 561	410 450	356 925	169 093	3 141 773
Slovakia	863 241	409 024	481 875	0	3 085	0	1 757 226
Romania	955 338	210 386	128 484	69 650	537 881	391 896	2 293 636
Ukraine	3 986 031	289 218	345 236	345 222	248 443	0	5 214 150

# Only projects from priority 4



# The key factors of success in field of partnership according the stakeholders

- **1.** Professional project team with experience
- 2. English speaking project team
- 3. Effective ccommunication between partners
- 4. Partnership between same type of institutions
- 5. Know the project partner before common history is a benefit

# ENI CBC HU-SK-RO-UA

The interest of applicants in ENPI CBC HUSKROUA in the previous period significantly exceeded the program's potential. The similar trend can be expected in the new programming period.

Allocation of the ENPI CBC HU-SK-RO-UA in 2007-2013 was 68 million EUR

Allocation of the ENI CBC HU-SK-RO-UA in 2014-2020 is 73 million EUR

The chance to succeed will have only projects that will be clearly written will have clearly goals, quality management, and so on.



# Thank you for your attention

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### Empirical Analysis of Intangible Assets as determinants of firm performance: Evidence from Western and Northern Europe

Smart Communities Conference 17th -18th May 2018, Herľany, Slovakia

SILVIA MRÁZKOVÁ

Faculty of Economics

Technical University in Košice

## Content

Motivation and objectives of the research Data and research methodology

- I. Analysis of determinants of R&D expenses
- II. Analysis of intangible determinants of firm performance

III. Accounting for endogeneity of R&D expenses Conclusion

## Motivation

Europe 2020 – smart, sustainable and inclusive growth

Intangible assets as key growth drivers for the most countries (e.g. Corrado et al., 2009; European Commission, 2013)

Increase of investments into intangible assets in the corporate sector (e.g. Zambon, 2003)

"If you can't measure it, you can't manage it" (Drucker, 1969)

Problems:

- Lack of resources definitions that constitute intangible assets
- Inconsistent accounting recognition

Key references

**Eisfeldt and Papinikolaou** (2014, AER) conclude that *"unique features of intangible capital present a signifcant challenge for measurement"*.

**Clausen and Hirth** (2016, J. Corp. Fin.) *"create a measure, the purpose of which is to capture the immeasurable".* 

**Xue** (2007, Rev. Acc. Stud.), **Ciftci and Darrough** (2015, J. Corp. Fin.) address *"possible endogeneity problem between firms' compensation and innovation policies"*.

**Min and Smyth** (2016, App. E.) *"examine the impact of R&D on firm value in South Korea, a country in which corporate-funded R&D intensity is one of the highest in the world".* 

# Objectives

To estimate effects of R&D intensity determinants.

To model firm value of profit firms based on intangible indicators.

To quantify an effect of selected intangible asset proxies on firm performance.

To account for the endogeneous nature of R&D expenses.

## Data & Methods

#### Data sample:

Database Thomson Reuters

Time frame: 2013 – 2017, balanced short longitudinal structure of the data

Innovative profit companies from Western and Northern Europe

Excluding observations reporting zero value of R&D expenses or recognized intangible assets

Excluding financial firms and regulated utilities

Winsorized at 1%-level of R&D expenses to total assets

#### Methods:

Panel data regression model with individual fixed effects Generalized two-stage least squares model for panel data

# I. Analysis of determinants of R&D expenses

# Comparison of R&D expenses intensity in different research samples

Data Sample	Author(s)	Time	Firm-Year	Firm	Mean	Stdev	p25	p50	p75	Min	Мах
	Aution(3)	Frame	Obs.	Obs.	Wicall	Sidev					IVIAX
Northern und Western Europe Non-financial firms		2013 - 2017	1,666	334	0.044	0.046	0.012	0.026	0.064	0.000	0.388
US High-tech industry firms <sup>a)</sup>	Xue (2007)	1992 - 2000	1,859	-	0.100	0.220	-	0.040	-	0.000	1.990
Taiwan Non-financial firms <sup>b)</sup>	Tsai et al. (2016)	1996 - 2007	9,020	-	0.020	0.032	0.000	0.008	0.025	0.000	0.399
South Korea Stock listed firms <sup>b)</sup>	Min & Smyth (2016)	2007 - 2012	3,403	606	0.006	0.014	0.000	0.000	0.005	0.000	0.103
North America Non-financial firms <sup>b)</sup>	Clausen & Hirth (2016)	1980 - 2012	129, 678	-	0.059	-	-	-	-	-	-
North America Target firms in M&D deals <sup>b)</sup>	Clausen & Hirth (2016)	1980 - 2012	5,083	-	0.019	0.094	0.000	0.000	0.000	0.000	-

Notes: a) R&D calculated as R&D expenses divided by total sales, b) observations with zero value of R&D expenses included
# R&D determinants I.

 $RDAS_{it} = \beta_0 + \beta_1 MTB_{it} + \beta_2 AvgRDAS_{it} + \beta_3 PPEAS_{it} + \beta_4 LEV_{it}$ 

 $+\beta_5 ProfitAS_{it} + \beta_6 CashAS_{it} + \beta_7 SIZE_{it} + c_i + u_{it}$ 

where**RDAS**<sub>it</sub> is the dependent variable calculated as a ratio of R&D expenses and total assets,**MTB**<sub>it</sub> is the market-to-book value ratio,

 $AvgRDAS_{it}$  is the average value of industry R&D expenses scaled by total asset calculated b ased on TRIS classification,

**PPEAS**<sub>it</sub> is the net value of property, plant and equipment expenses scaled by total assets,

LEV<sub>it</sub> is a leverage calculated as a ratio of total liabilities and total assets,

**ProfitAS**<sub>it</sub> is the EBITDA scaled by total assets,

*CashAS<sub>it</sub>* is calculated as cash, its equivalents and short-term investments divided by current liabilities,

SIZE<sub>it</sub> is calculated as a logarithm of market capitalization value,

 $c_i$  is an unobserved firm heterogeneity constant over time, and

 $u_{it}$  is the idiosyncratic error.

# R&D determinants II.

		(1)	(2)			
Variable	Regression	Robust	Regression	Robust		
	coefficient	standard error	coefficient	standard error		
МТВ	0.0032***	0.0010	0.0032***	0.0010		
AvgRDAS	0.6360***	0.1854	0.6290***	0.1857		
PPEAS	0.0607**	0.0233	0.0617**	0.0236		
ProfitAS	0.0244**	0.0083	0.0248**	0.0080		
Size	-0.0055***	0.0016	-0.0054***	0.0015		
InventAS	0.0545*	0.0260	0.0547*	0.0266		
InvAS	0.0000	0.0000	-	-		
CashAS	-0.0018	0.0125	-	-		
Lev	-0.0012	0.0065	-	-		
Years_IPO	0.0000	0.0000	-	-		
R <sup>2</sup> within	0.1	565	0.1558			
ρ	0.9	9287	0.9	9290		

Note: \*\*\* (\*\*) (\*) denotes significance at 0.1 (1) (5) percent.

II. Analysis of intangible determinants of firm performance

# Intangible asset proxy variables I.

Sveiby (2010): Taxonomy of intangible assets (Direct intellectual capital methods, Methods based on ROA, Methods based on market capitalization, Scorecard methods)

250+ papers from the database ScienceDirect

Finance- and research- related journals

Years: 2013 – 2017

Keyword: intangible asset

15 papers relevant for our research

# Intangible asset proxy variables II.

Variable IntAS (e.g. Xue, 2007)

- Balance sheet Intangible Assets / Total Assets
- External acquisition of IA via outright purchase or as a result of business combinations
- Acquired IA: Intangible Assets (IAS 38), Goodwill (IFRS 3)

Variable RDAS (e.g. He and Wintoki, 2016; Peters and Taylor, 2017)

- R&D Expenses / Total Assets
- Internal generation of IA via investments into R&D

Variable RotaRM (Clausen and Hirth, 2016)

- Indirect measure of intangible intensity
- Calculation in three steps:
  - 1. ROTA = EBITDA / PP&E
  - 2. deduction of industry and year median from each value
  - 3. normalization by standard deviation

# Firm value determinants I.

 $MTB_{it} = \beta_0 + \beta_1 RDAS_{it} + \beta_2 IntAS_{it} + \beta_3 RotaRM_{it} + \beta_4 Additional_{it} + c_i + u_{it},$ 

where  $MTB_{it}$  is a dependent variable market-to-book value ratio,  $RDAS_{it}$  is the percentage of R&D expenses on total assets,

*IntAS<sub>it</sub>* is the percentage of balance sheet intangible assets and goodwill on total assets,

 $RotaRM_{it}$  is the indirect measure of intangible assets introduced by Clausen and Hirth (2016),

Additional<sub>it</sub> is the vector of additional variables,

 $c_i$  is an unobserved firm heterogeneity constant over time, and

 $u_{it}$  is the idiosyncratic error.

# Model selection strategy

Regressor	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	1.770***	1.768***	1.768***	1.854***	-18.370***	-18.035***
	(0.067)	(0.118)	(0.214)	(0.207)	(2.752)	(2.691)
DDAC	10,374***	11,523***	11,523***	11,923***	9,679***	10,278***
RDAS	(0.751)	(1.726)	(3.396)	(3.367)	(2.446)	(2.570)
lot A C	-0.652***	-0.732*	-0.732	-1.116*	-1.510***	-1.605 ***
IIIIAS	(0.173)	(0.319)	(0.442)	(0.466)	(0.454)	(0.400)
PotoPM	0.810***	0.596***	0.596*	0.642*	-0.098	-0.109
ποιακίνι	(0.072)	(0.104)	(0.266)	(0.259)	(0.211)	(0.213)
DrofitAS	-	-	-	-	4.776***	4.787***
PIUIIIAS					(0.925)	(0.939)
	-	-	-	-	1.671***	1.711 ***
Lev					(0.397)	(0.395)
	-	-	-	-	-0.001*	-0.001*
					(0.001)	(0.001)
Sizo	-	-	-	-	0.878***	0.874 ***
5120					(0.126)	(0.125)
ΙονΔ	-	-	-	-	0,000	-
					(0.000)	
CashAS	-	-	-	-	0.169	-
CasiiAS					(0.535)	
DDEAS	-	-	-	-	1.306	-
					(0.812)	
Years	2013 - 2017	2013 - 2017	2013 - 2017	2013 - 2017	2013 - 2017	2013 - 2017
Firm effects	no	yes	yes	yes	yes	yes
Time effects	no	no	no	yes	no	no
Clustered	no	no	Yes	yes	yes	yes
R <sup>2</sup>	0.178	0.060	0.060	0.078	0.389	0.387
R² adj.	0.177	-0.192	0.058	0.074	0.385	0.384
ρ	-	0.751	0.751	0.755	0.936	0.933
Notes: Figures in par	enthesis are standard	errors. *** (**) (*)	denotes significanc	e at 0.1 (1) (5) perce	ent.	

# III. Accounting for endogeneity of R&D expenses

# Endogeneity of R&D expenses

### **Instruments:**

Average value of RDAS in industry AvgRDAS (Xue, 2007; Ciftci and Darrough, 2015)

PPEAS (Tangible assets/Total assets) – intangible sources become the tool of value creation mostly in combination with other tangible assets

**Test of exogeneity of instruments:** 

Sargan-Hansen statistics	P-value	Interpretation
0.082	0.7748	When the variable AvgRDAS is exogenous, than also the variable PPEAS is exogenous.

# Generalized two-stage least squares model for panel data

Regressor	<b>Regression Coefficient</b>	<b>Robust Standard Error</b>	Significance
RDAS	21.2325	9.2948	*
IntAS	-1.5916	0.4015	***
RotaRM	-0.0490	0.2274	
ProfitAS	4.2581	1.0170	***
LEV	1.6605	0.3815	***
SIZE	0.9176	0.1379	***
IPO	-0.0015	0.0008	*
Years		2013 - 2017	,
Firm effects		yes	
Time effects		no	
Clustered		yes	
R <sup>2</sup>		0.358	
ρ		0.933	

Note: \*\*\* (\*\*) (\*) denotes significance at 0.1 (1) (5) percent.

# Conclusion

Intangible assets are an important determinant of firm performance in an European country context.

European companies are less R&D intensive than US companies.

Tangible assets might be used as an instrumental variable for estimating the value of R&D intensity.

Each of our intangible proxies leads to the different conclusions.

### Thank you for your attention!

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IMPACT OF GLOBALIZATION TENDENCIES AND COMPETITIVENESS FACTORS ON OPERATING SURPLUS OF ENTERPRISES IN VARIOUS REGION TYPES



Roman Novotný Tomáš Valentiny Emília Huttmanová Dominik Gira



Our study aims at determining and characterizing the influence of selected factors of competitiveness and globalization trends, which at a different point of view can also be perceived as regional disparities (such as GDP per capita, investment volume directed into the region, or household consumption in the region), of regionally established businesses, depending on the specific type of the region. Impact intensity of selected indicators was determined by generalized linear models (GLM) based on the assumptions of evaluated data.



Austria, Bulgaria, Czech Republic, Denmark, Estonia, Spain, France, Croatia, Italy, Latvia, Hungary, Portugal, Romania, Slovakia and Finland Used data consists of cross-sectional units tracked over 5 years, namely in 2011-2015.

### Dependable variables:

Operating Surplus of Enterprises in specific type of Region (Urban, rural, mountain or border) [percentage]

### Independent variables

Employment in specific type of Region [percentage] Gross Domestic Product per capita [no unit] Consumption of Households [percentage] Export [percentage] Import [percentage] and others.



The first of evaluated predictors, which are individual for each of the models, can be characterized as the number of employees employed by enterprises in the chosen region and the analysis has shown that there is an indirectly related relationship between the relative indicator of corporate profitability and employment in the regions concerned. This situation results from the fact that wage costs are one of the primary segments of company's total costs, but employee productivity is growing more slowly than wage increases.

The most pronounced impact of employment was recorded in rural areas, mainly due to the fact that in these regions, was observed significantly lower proportion state of population's employment, than in the other types of regions.



Next variable is the **logarithm of aggregate production of the country, expressed per capita**. This factor **achieved in all significant cases the expected direct relationship** as it can be perceived as an indicator of state of the economy. **The lack of statistical significance of the predictor in the case of urban regions** results from the fact that multinational enterprises are concentrated in cities, companies that are able to compete on foreign markets. These firms are therefore not so dependent on the development of the domestic economy and their production is oriented towards foreign markets. **Opposite phenomenon appears in businesses in rural areas.** For these regions, the state of the economy is the most pronounced, which is related to the primary orientation of enterprises on the domestic market.

Another variable included in the assembled model was the ratio of household consumption to the size of its aggregate production. Even in this case, there was a directly proportional relationship for each model resulting from higher level of demand. It either stimulated businesses to increase production, or influenced the price level of products, depending on the optimization of business profits. Not surprisingly, the highest intensity of impact has been determined in enterprises established in rural areas where is the highest degree of interconnectivity with purchasing power of population.

In the analysis, we also considered the impact of foreign trade balance of the country - import and export. We treated export as a representation of expected increase in operating surplus of enterprises in the region in all models. Import, on the other hand, was a reduction in the expected proportional operating profit of entrerprises. The most striking finding of applying the model on country's trade balance indicators is the most intense impact of these factors within the regions with primary rural settlements. This finding is related to the fact that in the case of those companies operating on a relatively saturated market, where the increase in market share played a challenging role due to strong competition, has this situation led to a fact that any possibility of increasing the sales of company's products has enormously increased the production of businesses and thus their profitability.

### HICP

We also considered the impact of inflation, namely the HICP, because higher consumer price reduces the competitiveness of products when compared on international level. However, findings from models assembled shows the presence of statistical significance only in case of regions with significant rural settlements. This points to the fact that during the period under review and in the economies in question, the first of the effects considered i.e. the change in the competitiveness of products on other markets as a result of changes in inflation, does not play a relevant role and inflation can be considered only on the basis of the redistribution of capital within the economy, which contributes to raising the proportional level of the company's operating profit. The absence of factors of such importance in other models is linked to the higher concentration of export regions (compared to rural regions).

We also considered **compensating employees with all kinds of expenditures** (wages, tax contribution to the social and health fund, etc.), regarding factors of labor market, associated with employment of the labor force, respectively. with the ratio of compensation to the company's returns. Within all significant input variables in the assembled model, a direct relationship was recorded. **This phenomenon was most significant in rural areas**, which is linked to the growth in consumption (as these regions are heavily dependent on it).

The last of factors we considered in our models are **the taxes on production** (excise taxes, VAT and income tax), but we did not consider taxes and duties imposed on imports respectively their ratio to operating surplus. This was the tax paid by domestic producers, which had **a statistically significant impact only in mountain and border regions**. The absence of significance for urban and rural regions is linked to a proportional increase in income (or operating surplus) and taxes levied on domestic producers in these areas. For mountain regions, the relationship between the chosen factor and the predicted variable was directly proportional ie the tax grew more slowly than the operating surplus of enterprises, indicating increased tax optimization of businesses (mainly tourism) to increased production (services).



# THANK YOU FOR YOUR ATTENTION





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# **Smart City Solutions in the Capitals of the EU Countries**



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University of Miskolc Institute of World and Regional Economics

Herlany, 2018.

### Content

- Introduction
- Literature review
  - usage of different expressions of smart city,
  - definition of smart city
- Measurement of the development of smart cities
- Smart City Projects in EU Capitals
- Special Projects in the EU Capitals
- Conclusion



### Introduction

- Developing countries
  - rapidly growing (young) population,
  - developing sustainable structures.
- Developed countries
  - aging populations.
  - improving the quality of life,
  - reducing social inequalities,
  - developing sustainable structures.
- Smaller, medium-sized towns
  - system-oriented solutions.
- Big cities, capitals
  - more fragmented solutions,



### Literature review

- Centuries ago
  - innovative solutions were driven by the development of mechanical machines (Péter Baji, 2017).
- After Second World War
  - quality of life and human life (Zenetos 1969).
- 'Cybercity', 'information city' or 'digital city' were introduced in the literature of town development (Batty 2012).
- Integration of settlements and digital technologies in the 21st century (Rab et al., 2015).
- Cities are trying to solve complex problems, while increasingly elaborated processes need to be treated (Nagy Z. et al., 2016).



# Frequency of mentioning 'Smart City' and similar expression in English and Hungarian

HU	google HU	%	goog le tudó s	%	EN	google EN	%	google scholar	%
"okos város"	127 000	88,82	82	47,40	'smart city'	54 600 000	6,41	2 480 000	12,18
"intelligens város"	7000	4,90	26	15,03	'intelligent city'	64 800 000	7,61	2 650 000	13,01
"tudás város"	1100	0,77	2	1,16	'knowledge city'	147 000 000	17,26	4 530 000	22,25
"fenntartható város"	3270	2,29	41	23,70	'sustainable city'	3 320 000	0,39	2 360 000	11,59
"tehetséges város"	414	0,29	0	0,00	'talented city'	76 100 000	8,94	338 000	1,66
"összekapcsolt város"	230	0,16	1	0,58	'wired city'	27 700 000	3,25	305 000	1,50
"digitális város"	3780	2,64	14	8,09	'digital city'	335 000 000	39,34	3 020 000	14,83
"információs város"	196	0,14	7	4,05	'information city'	143 000 000	16,79	4 680 000	22,98
összesen	142 990	100,00	173	100,00	sum	851 520 000	100,00	20 363 000	100,00

Source: own compilation based on google data



# **Definition of smart city**

- 'a Smart City is a city well performing built on the 'smart' combination of endowments and activities of self-decisive, independent and aware citizens' (Giffinger et. al 2007),
- 'smart city is the use of information and communication technology to sense, analyze and integrate the key information of core systems in running cities' (IBM, 2010),
- 'a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance' (Caragliu et al., 2011),
- 'a smart community is a community that has made a conscious effort to **use information technology to transform life and work within its region in significant and fundamental rather than incremental ways**' (California Institute, 2001),



## **Definition of smart city**

- 'Concept of a Smart City where citizens, objects, utilities, etc., connect in a seamless manner using ubiquitous technologies, so as to significantly enhance the living experience in 21st century urban environments' (Northstream, 2010),
- 'Smart City is the product of Digital City combined with the Internet of Things' (Su et al., 2011),
- 'a smart city is a well-defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of well-being, inclusion and participation, environmental quality, intelligent development; it is governed by a well-defined pool of subjects, able to state the rules and policy for the city government and development' (Dameri, 2013).



## Measurement of the development of smart cities

- Smart Cities Index of the EasyPark research institute.
- Defined factors of the smart city
  - digital availability (4G, Wi-Fi hotspots, smartphone usage),
  - essentials to the operation of a smart city (knowledge-based transport and mobility, smart parking, traffic sensors and car sharing apps).
  - factors of sustainability (clean energy, environmental projection)
  - access to community services,
  - active participation in public affairs.
- 500 medium-sized cities were selected from the developed and middledeveloped countries
- 100 of them ranked by more than 20000 technologists and urban development journalists.
- Settlements with population between 100,000 and 500,000, at least 1 University, a catchment area of less than 1,500,000 inhabitants.



### **Smart Cities Index**

Country	Capital City	Smart city index 2017 rank	Smart city index 2017 final score	Smart Parking	Smart Building	Waste Disposal	Urban Planning	Quality of living rank 2018
Austria	Vienna	32	6,84	7,06	9,48	7,18	7,62	1
Belgium	Brussels	62	5,64	6,11	5,50	8,32	5,06	27
Bulgaria	Sofia	94	3,78	3,68	1,61	2,50	7,09	116
Croatia	Zagreb	no data	no data	no data	no data	no data	no data	98
Cyprus	Nicosia	no data	no data	no data	no data	no data	no data	no data
Czech Republic	Prague	72	5,14	6,54	3,77	2,32	5,94	69
Denmark	Copenhagen	1	8,24	9,81	9,83	8,24	7,09	9
Estonia	Tallinn	76	4,75	3,16	2,30	7,09	7,62	87
Finland	Helsinki	23	7,02	8,53	7,41	6,82	10,00	32
France	Paris	20	7,14	7,20	7,14	6,38	4,44	39
Germany	Berlin	13	7,39	6,92	7,31	9,82	6,12	13
Greece	Athens	91	3,90	1,87	3,94	1,97	3,12	86
Hungary	Budapest	79	4,38	7,66	3,86	3,47	3,74	76
Ireland	Dublin	42	6,59	8,10	8,18	5,24	7,62	34
Italy	Rome	71	5,19	6,14	7,75	5,76	6,82	57
Latvia	Riga	75	4,90	4,55	2,21	2,06	6,82	90
Lithuania	Vilnius	73	5,13	4,03	3,77	3,38	9,12	81
Luxembourg	Luxembourg	22	7,10	4,20	7,40	6,56	9,74	18
Malta	Valletta	no data	no data	no data	no data	no data	no data	no data
Netherlands	Amsterdam	8	7,54	7,95	7,32	7,79	5,94	12
Poland	Warsaw	89	3,97	5,07	2,82	4,35	5,06	82
Portugal	Lisbon	64	5,46	4,98	5,59	4,79	4,44	38
Romania	Bucharest	87	4,00	5,33	1,09	1,18	3,74	107
Slovakia	Bratislava	82	4,21	3,25	3,16	2,59	6,47	80
Slovenia	Ljubljana	66	5,32	5,41	5,15	6,47	9,74	75
Spain	Madrid	51	6,32	6,71	6,88	3,65	5,94	49
Sweden	Stockholm	3	7,82	7,49	6,88	8,94	7,62	23
United Kingdom	London	17	7,18	8,48	8,10	6,12	5,94	41

Source: own compilation based on https://easyparkgroup.com/smart-cities-index/



## Relationship between the quality of living and the selected factors

Smart city index 2017 rank	Smart city index 2017 final score	Smart Parking	Smart Building	Waste Disposal	Urban Planning	Quality of living rank 2018
0,8787	-0,9010	-0,6620	-0,9090	-0,8034	-0,2152	1

Source: own compilation



### Giffinger Smart City Concept's six factors in EU Capitals

Smart Cities criteria Capital City	Smart Economy	Smart People	Smart Government	Smart Mobility	Smart Environment	Smart Living
Vienna	x	X	x	x	X	X
Brussels			X		X	X
Sofia			X			
Zagreb	x		X	X		
Nicosia			x			
Prague			x	x	X	X
Copenhagen	x	X	x	x	X	X
Tallinn	x	X	X	x		
Helsinki	x	X	x	x		
Paris		X	X	x		X
Berlin	x		X	X		X
Athens			x	x		Х
Budapest			x	x	X	X
Dublin			x	x	X	
Rome			X	X		X
Riga			x		X	X
Vilnius			x		X	
Luxembourg			x			
Valletta			x			
Amsterdam	x	X	x	x	X	X
Warsaw			x	x	X	X
Lisbon	x		x	x	X	X
Bucharest			x	x		Х
Bratislava			x			X
Ljubljana	x		x		X	X
Madrid			x	x	X	X
Stockholm		X	X		X	X
London	x	X	X	x	X	X

Source: own compilation



# **Smart City Projects in EU Capitals**

- Amsterdam Smart City
  - unique partnership between companies, public sector, research centers, universities and residents of Amsterdam.
  - Free Wi-Fi Amsterdam, Open Data Program, Smart Light Program, Health Lab, Energy Cells ... etc.
- Smart City Wien
  - significantly reducing emissions (CO2, greenhouse gases),
  - long-term objective: a zero emission city, zero emission buildings as standard, significantly reducing energy consumption,
  - leading European Centre for research and technological development.
- London
  - put great emphasis on public transport and energy efficiency,
  - supervised by British Standards Institution, which helps to build the city's own smart city program,
  - Beddington Zero Energy Development,
  - CADBEAM Real Time Tracking for Constructions,
  - Vehicle Movement Planning System,
  - London Datastore ... etc.




Residents will be able to use the battery in their electric car to store their locally produced energy. Residents will be able to decide how to put their locally produced energy (i.e. from solar panels) to use. The can be energy transferred the to energy grid, used immediately or stored in the battery of an electric car, to be used at some later time to drive the car or run household appliances.



/ILÁG- ÉS REGIO

# Smart bins send e-mails when they are full! – Dublin



It is a Wi-Fi-enabled bin can communicate when the waste reaches 85% capacity. The bin actually sends a text message and email to the concerned waste management department informing them that they are ready to discharge.



#### **SOHJOA driverless minibus in Helsinki**



driverless minibus that converts traffic to Helsinki Smart Region. Electric-driven minibuses were tested on public roads and from passengers autumn 2016 in Helsinki, Espoo and Tampere



G- ÉS REGIONALI

TAN INT

#### INTEGRATED SMART PARKING SOLUTION- BERLIN



Siemens Integrated Smart Parking Solution is a modular, infrastructurebased sensor system that goes beyond the possibilities of ground sensors. Imagine a tool that allows you to effortlessly form a clear picture of where available parking spaces can be found and how long each space has been occupied for, while providing an overview of improper usage of any non-parking areas as well as nearby Bicycle and Emergency Vehicle lanes. routing and enforcement From applications to city dashboards, this detailed parking and violation information can then be accessed by various audiences, from would-be and commuters commuters to designated law enforcement personnel.

#### Conclusion

- Looking at the situation of the European Union's capital cities, there are very different maturity levels,
  - capital cities especially in the Mediterranean, where the emergence of 'smart apps' and 'projects' is almost impossible to find,
  - IT tools is likely to be possible, but there is no information about conscious strategy.
- Other settlements recognized
  - that "smart applications" are essential for the development of cities,
  - many developments have been implemented but there are no synergistic effects.
- For some capitals have conscious strategy where
  - the developments reinforce each other,
  - there is at least one project coordinating organization (run by the local government or some community or private initiative).
  - significant competitive advantages.





## Thank You for your attention!



OROSZ, Dániel <u>regpzs@uni-miskolc.hu</u> Dr. PÉTER, Zsolt <u>regpzs@uni-miskolc.hu</u>

#### SMART COMMUNITIES WORKSHOP FOR PRACTITIONERS AND SCIENTISTS

LOCAL AND COMMUNITY DEVELOPMENT BUILDING SMART COMMUNITIES



## S M A R T COMMUNITIES

VIRTUAL EDUCATION AND RESEARCH AND DEVELOPMENT AND INNOVATION NETWORK IN THE SLOVAKIAN - HUNGARIAN BORDER REGION

17<sup>TH</sup> - 18<sup>TH</sup> MAY 2018, HERĽANY, SLOVAKIA



#### Development of smart traffic evaluation- and influence-modules based on non-declarative rules of artificial intelligence

LÁSZLÓ PITLIK – LÁSZLÓ PITLIK (JUN) – MARCELL PITLIK – MÁTYÁS PITLIK – ÁRON GYIMESI My-X research team Hungary

#### **Multidisciplinar paper**

1111111111

Evolution of a project

 Power of mathematics
 Effect of I40 thinking

v-X.hu

#### TRAFO (Traffic Optimization System) project -GINOP-2.1.1-15-2016

- Traffic simulator based on mathematical forecast of upcoming events based on AI application
- The goal of the project is a simulator accomplished that can be applied universally

#### An economist's view

• Key findings by the tender documentation:

- X

- Bottom up approach technology oriented project
- The core modeling technology was not decided
- There was no strategic management frame
- The value add was not exposed
- The project seemed a quasi I40 project

#### **Proof of Concept**

Hypothesis: We assumed that our previously published function consisting the **I40 value** proposition and I40 management framework can be applied to TRAFO project

- X

Expected result: the PoC – TRAFO is an I40 project, I40 management framework is operational in this case

#### Value oriented I40 definition

11111111111111

 Industry 4.0 is "the integration of complex physical machinery and devices with networked sensors and software, used to predict, control and plan for better business and societal outcomes." (LU, 2017)

My-X.hu

#### **I40 value proposition**

 I40 project value proposition = utilizing the new technologies + generating information + using autonomous decision making procedures + applying I40 management framework (targeted busines layer + deficit management + strategic management tools) (Gyimesi, 2017)

## TRAFO was not designed as an I40 project

- Missing technology decisions
- Missing I40 management framework elements:

-X.hu

- Business Layer Goal
  - (Technology, Internal Process Cost Effectiveness, Business-Sales Layer)
- Deficit management and risk mitigation
  - (Internal, Contractual, Governmental)
- I40 strategic management framework
  - (I40 related strategic decisions to make project happen)

## TRAFO retroactively become I40 compliant...

... along with the project meetings we provided the missing the theoretical and also operational elements

-X.hu

- Technologies:
  - (Android, MongoDB, Cloud-based AI-server with API)
- Goals: Business-Sales Layer
- Deficit management: along with the project management
  - (Key deficits: knowledge, interfacing, missing econometrics, missing premade modules, lack of standards)
- Management framework: along with the project management
  - (Comparisons, Add values, Inclusivity / Exclusivity, Income models, Meaning of general solution, Usable legacy systems, IT security)

#### **Confirmed: Function applicable**

TRAFO (retroactive) I40 value proposition = Android, MongoDB, Cloud-based AI-server with API + traffic related data defined controller information + **AI decisions for better traffic evaluation** + applied I40 management framework (new business + risk minimization as deficit management + core decisions by the I40 strategic management tool)

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PoC: The function and the I40 management framework provide real guideline and accelerator. These helped focusing, also making simple and add value to the project.

#### AI Modeling – State of the art approach

 Solution without classic physics—based behaviour patterns of moving objects

-X.hu

- The core idea is based on abstraction of similarities – idea of the universal model
  - Similarities make possible to derive non-declarative rules
  - Similarities ensure multi-layered evaluation in an automated way
- Findings
  - The aggregated evaluation can be derived for the entire traffic system and/or also for its parts
  - Time series of the evaluation derives parallel models being able to estimate the next aggregated evaluation value of traffic

#### **Estimiting the upcoming traffic cases**



My-X.hu

Figure 1 Demo map without and with evaluation layer



The basic pillars of the project are from KNUTH (1992: Science is what we understand well enough to explain to a computer. Art is everything else we do.)

## Thank you for your attention!

## Details

My-X.hu

#### PPT: http://miau.gau.hu/miau/239/kosice.pptx

#### Full text: http://miau.gau.hu/miau/238/Manuscript\_Template \_2017\_myx.docx

#### **Studies:**

Pitlik L. et al. (2018a). Traffic-optimization: monitoring/evaluation sub-system, MIAU No.233 HU ISSN 14191652, http://miau.gau.hu/miau/233/kvant\_monitoring\_v5.docx

Pitlik L. et al. (2018b). Simulation layers of traffic management based on similarity analyses, MIAU No.235 HU ISSN 14191652, <u>http://miau.gau.hu/miau/235/kvant\_simulation\_v1.docx</u>

Pitlik L. et al. (2018c). Genetic potential in the traffic optimization, MIAU No.235 HU ISSN 14191652, http://miau.gau.hu/miau/235/kvant\_geneticpotential\_v1.docx

Gyimesi Áron (2018): Az Ipar 4.0 paradigma adaptációjának lehetőségei és korlátai a vállalatok szemszögéből, Tavaszi Szél Konferencia, Széchenyi István Egyetem 2018.05.04.

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# Urban development in the light of climate change

Michal Schvalb | Carpathian Development Institute | May 17, 2018

#### Presentation overview

KRI

- Why climate change?
- What makes climate change a very complicated issue?
- Why cities are on the front lines of the climate change fight?
- What is the current state?
- What can be done?

### **Climate Change**

- The Human Factor
- Unprecedented scale
- Scientific consensus
- The Global Threat
- Interconnectivity



KRI

#### If only things were that simple

- Certain Uncertainty
- One Atmosphere vs. Many Desires
- "Pass the Buck"
- Facts matter



#### Climate change and cities

- The Perpetrator
- The Victim
- The Responsible Authority



KRI



#### What is the current situation in Slovak Cities?

- Variation between known knowns, known unknowns and unknown unknowns
- Lack of systematic approach
- Low public pressure
- Absent of participation mechanisms
- Shortage of local expertise
- Lack of good examples
- Legal, strategic and institutional framework on national level does not ask to cities to act

### Our effort in climate change fight on local level

- Improve national framework
- Increase awareness
- Give professional support to those who want to lead by example
- Create systematic approaches, tools and guidelines





# Time to act is now!

Michal Schvalb Carpathian Development Institute, Kosice www.kri.sk



KRI



## The relationship between public transport and tourism in Budapest

<u>Botond Sikó</u> (Szent István University) ۵ Bulcsú Remenyik (Budapest Business University) ۵ Lajos Szabó (Szent István University)

László Guth (Szent István University)

2018

#### backgrounds



- transformation of the capital's public transport
- local and international tourism changes
- new trends of Budapest's guests, city structures and attractions



https://media-cdn.tripadvisor.com/media/photos/0d/cf/e6/7c/nyugati-square-photo.jpg

#### about the research

SZENT ISTVÁN EGYETEM GAZDASÁG- ÉS TÁRSADALOMTUDOMÁNYI KAR Enyedi György Regionális Tudományok Doktori Iskola

- three parts
  - "Survey of foreign tourists on public transport in Budapest" (Monitor Social Research Institute, 1999)
  - online and personal questionnaire (2016)
  - own online questionnaire (2018)



#### aims of the research

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SZENT ISTVÁN

- analyze the results of previous and current surveys
- differences, changes, trends, tendencies
- focus on the causes of change and the factors influencing the development of tourism and transportation
- three main goals:
  - $\blacktriangleright$  implementation of the fresh questionnaire survey  $\rightarrow$  needs, satisfaction and preferences of the Hungarian population
  - analyze the results of two researches carried out in the past based on current trends and current observations
  - draw conclusions on the role of public transport, the needs of passengers and the transformation of these



#### overview and tendencies

- Budapest public transportation: big system (four subways, 27 tram trains with 593 vehicles, more than 200 bus lines with 1,600 vehicles, 14 trolley buses, five local railways etc.)
  - important role for local residents and visitors of the city
- past decade: high number of changes (modernization)
  - ▶ "mass transport"  $\rightarrow$  "public transport"
  - ▶ Budapest Transport Center (BKK) established in 2011  $\rightarrow$  coordination
  - new services (BKK Futár route planner and real-time information system; BKK Info system in case of disruptions; new ticket- and passvending machines etc.)
  - purchase of new vehicles (today: 19% of buses made before 2000, only 50% of the buses are produced after 2010)



#### overview and tendencies

#### other important area: taxi service

- integral part of the capital's public transport
- ightarrow availability of the Liszt Ferenc International Airport
  - taxi or bus service
  - direct bus 100E from the airport to the city centre



https://nlc.p3k.hu/uploads/2018/02/100e3.jpg



#### own research - key research points

- main motivations of public transport
- the ticket and lease constructions used by respondents
- the evaluation of the most important factors influencing new developments
- services and the quality of service
- the tendency of change in their quality
- most of the respondents: 18-22 years old (over 40 only 16%)
  - overview of the views of young and young middle-aged people


#### usage of public transportation



- important part of Budapest's life and for locals' transportation
- high usage of night services as well
- airport connection usage low
- 81% have a Budapest travel pass, only 16% of them use single tickets



#### usage of taxi transportation



- big percentage of never and rare users
- night role important
- airport link (alternative to public transport services)



#### usage of new technology



Source: own research, own editing (2018)

- successful innovations
- stunningly low usage of taxi applications

#### SZENT ISTVÁN EGYETEM GAZDASÁG- ÉS TÁRSADALOVTUDOMÁNYI KAR

GAZDASAG- ES TARSADALOMTUDOMANYI KAR Enyedi György Regionális Tudományok Doktori Iskola

#### opinions about quality

- reliability of taxies is not high, only acceptable or bad
- their amount has a good reputation
- condition of vehicles is seen "bad" by lot
- way to get information
  - about timetable: good
  - in case of service problems: rather bad
- way of buying tickets and passes: good
- daytime service and timetable: good
- night service timetable and lines: not good

Opinion about the service quality in different fields (distribution)

reliability of taxies (e.g. fair pricing) amount of taxies condition of vehicles (e.g. modernity, hygiene) way to get information (e.g. at service interruptions) way to get information (e.g. about timetable) way of buying tickets and passes night services (timetable) night services (lines) daytime services (lines)



■outstanding ■good ■acceptable ■bad

Source: own research, own editing (2018)



#### opinions about quality change tendencies

- reliability of taxies falls or no change
- improvement in condition of vehicles not seen by a lot of people (failing tendency!)
- way to get information and to buy tickets or passes improves (new technologies!)
- daytime services have also a developing tendency
- night services seen as stagnating

Opinion about the change of the service quality in different fields (distribution)



#### comparison

- research of 1999
  - participation of tourists from abroad
  - ► lack of technical possibilities and capabilities → difficult to compare this with today's situation
  - no use of discount ticket possibilities (8% used passes and only 5% the Budapest Card)
  - > 90% did not have unpleasant experiences
  - if yes: delays, thefts and behavior of the passengers, and the attitudes of the BKV staff (no helpfulness)



#### comparison

- research of 2016
  - 70% of respondents were informed about the details of public transport via the Internet (growth of new technology)
  - but: 14% of respondents considered printed publications as important (→ second most important form of information)



https://i.ytimg.com/vi/sVL7UOT3KA4/maxresdefault.jpg



https://bkk.hu/apps/img/futar/futar\_20.jpg

#### conclusions

- use of single tickets quite high: increased the potential to travelling without paying
- foreigners: often unaware of the different types of tickets
- airport infrastructure insufficient (ticket vending machines, bus freugency)
- for locals: bus to the airport is not comfortable; taxi is too expensive
  - local people use taxis in a way too small amount
- development of the direct bus 100E

#### conclusions

- transforming guest content of the city
- ► economic crisis and the bankruptcy of Malév → less conferences, less business travellers
- Michalkó (2007): main taxi journey destinations of foreign tourists: airport, followed by hotels, sights, restaurants, railway stations, spas and other sights
- today: change (mainly because of higher price sensitivity of tourists)
  - Iot of tourists have own transportation from airport (e.g. by group)
  - bus is cheaper and acceptable for them as well
  - challange for taxi companies

#### conclusions

- growing importance of the night life
- more young tourists  $\rightarrow$  have fun and relax
- ▶  $7^{\text{th}}$  district: party district  $\rightarrow$  lot of taxis
  - larger number of in-town night-time journeys, than airport trips
- comfort tools in public transportation  $\rightarrow$  not appeared in taxis

#### recommendations

- applications for taxis and making orders and system easier (modern technologies!) → building interest and trust in the service + winning locals to use the services
- see needs and expectations of the local population and their main critical aspects
- develop public transport closely with the trends in the composition
- ▶ new kinds of ticket types and more pass offers → better feedbacks and more economical journeys
- vehicles and passenger information at critical points  $\rightarrow$  improvements done
  - ▶ huge base and many types people → Not all needs can be met, but efforts must be made to achieve this.

#### recommendations

- Public transport in Budapest:
  - performs well and develops in many ways
  - additional opportunities for innovation should be noted
  - efforts made so far should be continued
  - → dynamically evolving in parallel and together with the city, its residents and visitors



http://4.bp.blogspot.com/-EVR0r0jQcM4/VNi-RgB\_00I/AAAAAAAAAvw/EV8hx8UNHqA/s1600/Rizsa vi%2BTam%C3%A1s.jpg

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GTK

GAZDASÁG- ÉS TÁRSADALOMTUDOMÁNYI KAR Enyedi György Regionális Tudományok Doktori Iskola

# Thank you for your attention!



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### Smart Governance and the Participatory Citizenship

Sinčáková Žofia, Kepičová Adriana SMART COMMUNITIES CONFERENCE 17.-18.5.2018 Herľany, Slovakia

#### Content

- Introduction
- Smart Governance Concept
- Participatory City Governance and Participatory Citizenship
- Participatory Budgeting in Case of Slovakia
- Advantages/Disadvantages of Participatory Approach to City Governance

2

### Smart City

- Definition is not unitary it is impossible to give a simple explanation
- Smart city definite as sixth dimensional model : (1) Smart Governance
  (2) Smart Economy (3) Smart Mobility (4) Smart Environment (5)
  Smart People (6) Smart Living
- Overlap with other models: e.g. 'Intelligent City', 'Knowledge City' 'Wired City', 'Digital City', 'Eco-City'.
- Generally different emphasis in particular cities on different characteristics from the smart city model

3

#### Smart Governance meaning

the key elements of a ideal smart governance:

- Transparent goverment
- Participation in decision-making
- eServices for public
- Support of investment in human and social capital
- Support innovation in city in means of policy and technology

#### Participatory City Governance

- Foundation make more revelant decisions of the use of public spaces; citizen is becoming more engage in the process of decisionmaking.
- Connected with Participatory Budgeting process of allocation public resources more transparently and for iniciatives that are iniciated by public (local citizens).

#### Models of Participatory city Governance

- Different model adapted in different countries
- Porto Alerge concept alligned in Europe
- Porto Alegre:
  - Involve discussions in neighboorhood/thematic assemblies
  - Concrete investments or projects
  - Decisions made upon what to priorotize in the budget
  - ► To educate and encourage citizens to get involve with the local goverment

6

Participants: NGOs, local governmet, citizens

#### Slovakia and Participatory Governance

- Before: the request of citizens were collected
- The legitimacy of the decision-making process was in the hand of local government
- Now: the aim is to open the government and to give opportunity for more active participatory citizenship
  - The power is taken from politicians and is given to citizens ability to vote
  - The idea is supported via introduction of new Internet based tool for active engagement (social media, wed pages, online surveys)

#### Slovakia and Participatory Governance

Participatory governance in terms of participatory budgeting (PB) process were citizens are involve in the creation of budget via projects that are funded from the local governance.

8

- Slovakia is just a "newbie" in the PB
- Mainly iniciated by NGOs
- Beginning in Bratislava (2011)
- Different areas for funded projects Youth, Seniors, Sport, Public Spaces, Trasnsportation...
- Meetings : public or neighbourhood
- Legislation rules and voting system (differ by city)

#### Legislation/Rules and Processes

- Age limits more than 15/18 (differ by city)
- Project can be presented just by private entities (no NGOs and organizers of the meetings) as citizens
- System of vote combination of online/offline system (e.g.Facebook "likes", web page)
- System of vote citizens: local politicions
- Duration of projects 1 years
- Realizators of the projects: mainly citizens with local government 6
- Calls for projects are published on the web side of the city
- Outcomes of the projects: improvements of local playgrounds, cyclopaths, public place - Street art,...

### Participatory Budgeting - Funding

Example - Bratislava - Nové Mesto

	2014	2015	2016	2017	2018
Overall expences	Over 16 mil. €	Over 19 mil. €	Over 17 mil. €	Over 26 mil. €	Over. 25 mil. €
Participatory Budgeting	25 000 €	40 000 €	40 000 €	50 000 €	40 000 €
% from the overall expences	2,01 %	0,91 %	3,53 %	0,58 %	0,79 %

Funding is dedicated to smaller project - no money demanding project

#### Participatory Budgeting - Funding

- Is the funding than suitable ? Examples of project outcomes :
  - ► Community garden 3000 €
  - ▶ Public space renovations in the city 5000 €
  - Small craft workshops for kids/families 5 000 €
- Small projects / realized by citizens max. 5000 € (Bratislava)
- Large projects realized by local government (plans are being discussed with the citizens in public discussions)

11

There are categorized investicions: A (citizens projects) B (large project/for the city) C (large projects/for city districts) D (most severe cases - priorities of the city) E (settlement of property relations)

#### Activism

- Activism or activist organization becoming influential not only locally but also globally (also with help of influencers - politicians, celebrities).
- The aim of such communities is to fight agains injustice in different areas.
- Research in the area suggest activism is a step to global citizenship raissing globall awerness (Schattle, 2008)
- The current influence od activism (movements) due to help of internet networks (social media) that can spread the message in a second (news are becoming viral on social media)

#### **Election and Participation**

- Democracy means power in the hand of the people
- Democracy = election right to choose a representative for the decision-making
- Classic political parties have their internal structures and many members - it seams their stopped doing politics for people, but for their own (scandals, corruption, ..)
- Candidates without affiliation to political parties are entering the politics - to bring innovations?, new approaches? to handling the system - tend to be more open to change

#### Mayors - party affiliation

**Bratislava - Nove mesto** - Independent candidate

14

- Ružomberok Independent candidate
- Banská Bystrica Independent candidate
- Levice party affiliation
- Šala party affiliation
- Trnava Independent candidate
- Partizánske Independent candidate

# Election shift from party to independent candidates ?

Municipal elections:

	2002	2014	2017* Latest elections
Independent candidates	32,65 %	37,96 %	38,7 %
Political party affiliation	67,35 %	62,04 %	61,3%

# Begining of Initial Research Conducted in Slovak Cities

- What was the reason/motivation for participatory budgeting ?
  - Inspiration from different cities success stories of the foreign cities
  - Increase interest of the citizens in public affairs in the city and create environment for realization of their own project and ideas
  - Suggestion of civic association/NGO
  - Suggestion of mayor/elected members
  - ► Give opportunity for citizens to spend 20 000 € from the yearly budget

Will the public administration become gradually more participatory ? How will it manifest?

"Participation have an additional character, it brings new ideas. Public administration controls specific areas that are limited by legislation and that creates barriers." (Liptovský Mikuláš)

"Yes, as long as the principles of deliberation and thoughtful consideration process, autonomy and cooperation process are preserved and cultivating. It will manifest in effective redistribution of ideas, innovations and greater identification of citizens with the city." (Bratislava-Nové Mesto)

#### Advantages/Disadvantages of Participatory Approach to City Governance in Slovakia

#### Advantages:

- Education of citizens
- Build trust in local government
- Local government Receive legitimacy from citizens for decision-making
- Support of active citizenships
- Slight change in legislation/improvement of legislation
- Local government cooperation with NGOs and citizens - creation of environment and relationships

Disadvantages:

- Time consuming
- Only for smaller projects
- Demotivation of some citizens to participate and be interested in public affairs
- "Unfriendliness" of some local politicians attempt to manipulate
- Manipulation by fake news?/hoaxes
- Many of the project are not realisable due to legislation - frustration of the citizens

#### Future Research Outline Hypothesis:

- H: Is the participatory governance a typical agenda of elected independent candidates (no party affiliation) ?
- H: Are activist, active citizens without party affiliation joining the local goverment/parlament? Or it is often only a speculation how to be elected? Or it is an effect of disintegration of political parties at the local and regional level?
- H: Is there a relation between the factors of age, gender, using internetbased poitical tools, independent candidature and election to local/regional parliament? Is there an effect of "youthquake" earning more recognition ?

#### Conclusion

- Participatory budgeting is a "newbie" in Slovakia
- However the biggest obstacle of participation is the legislation/the law
- Current situation: Participation only an additional character in Slovakia
- Active citizenships is being raise due to participation education of citizens
- Participation as the form of smart government need to raise awarness - among politicians and citizens
- Activism step to globall citizenships ?

#### Thank you for your attention.

Technical University of Košice, Faculty of Economics

## Theoretical background and problems of health care efficiency with DEA models

#### Jakub Sopko, Kristína Kočišová
### Outline

• Theoretical background – health sector and education

• Measuring efficiency with DEA approach

• Preliminary results of our analysis

• Next research and main questions

## Smart communities and health care

• Mobile Healthcare Apps

• E-health

• Smart Healthcare

• IoT technology



Source: VironIT Company

### "Tell me and I forget. Teach me and I remember. Involve me and I learn."

and

# "An investment in knowledge pays the best interest."

by Benjamin Franklin

### Starting points

• The assessing of health and education efficiency in a selected target group of OECD countries.

• Application of DEA methods.

• Examining the relationship between health expenditure and efficiency.

### Measuring efficiency in health sector and education

Study	Application	Type of data, years	Methods	Input and output variables
Hadad et al. (2013)	31 OECD countries	CS, 2007	DEA - 2 models	Inputs: Physicians, hospital beds, health expenditure,income, fruit and vegetables consumptionOutputs: Life expectancy, infant mortality
Grosskopf et al. (2006)	143 countries	CS, 1997	DEA - 5 models	Inputs: Health expenditure (public, private), gross capital formation, labor force, education Outputs: Life expectancy, infant mortality, income
Medeiros and Schwierz (2015)	EU countries	CS, 2011	DEA - 3 models	Inputs: Health expenditure per capita in PPP, GDP per capita, educational attainment, consumption of alcohol and tobacco, obesity, hospital beds, nurses, physicians per capita Outputs: Life expectancy at birth, at age 65; healthy life expectancy at birth, at age 65; Amenable mortality
Agasisti and Dal Bianco (2006)	Italian Universities	2002/2003	DEA	Inputs: number of teachers, non-teaching staff, financial and structural resources Outputs: publication count, number of graduates, research expenditures or grants
Retzlaff- Roberts et al. (2004)	27 OECD countries	CS, 1998	DEA - 4 models	Inputs: Beds, MRI, physicians, health expenditure, education, income inequality, tobacco consumption Outputs: Infant mortality, life expectancy

# METHODOLOGY

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### Data Envelopment Analysis

- DEA:
  - is a nonparametric method based on empirical data of selected inputs and outputs of production units.
- DEA:

$$\frac{weighted \ sum \ of \ outputs}{weighted \ sum \ of \ inputs} = \frac{\sum_{r=1}^{s} u_r y_{rq}}{\sum_{i=1}^{m} v_i x_{iq}}$$

• 
$$v_i$$
  $i = 1, 2, ..., m$  ... weights of i-inputs

•  $u_r$  r = 1, 2, ..., s ... weights of r-outputs

Data Envelopment Analysis - SBM model

• Super SBM Model

-Model of superefficiency

-Efficiency units gain the rate >1

### Preliminary results based on SBM model

Variables	Input/Output	Definition	Database
Life expectancy at birth	Output	The average number of years that a person could expect to live if he or she experienced the age-specific mortality rates relevant in a given country in a particular year.	OECD
Infant survival rate	Output (transformed from infant mortality rate)	Infant survival rate is calculated as difference between 1000 and infant mortality rate. Infant mortality rate is the number of deaths of children under one year of age expressed per 1000 live births.	OECD
Physicians' density	Input	The number of physicians, general practitioners and specialists, actively practicing medicine in a region during the year, in both public and private institutions.	OECD
Inaptient bed density	Input	Number of hospital beds (occupied or unoccupied) immediately available for use by patients admitted to all types of hospitals (general hospitals, mental health hospitals and other speialist hospitals) in all sectors (public and private).	OECD
Health expenditure as % of GDP	Input	Total expenditure on health include the final consumption of health goods and services plus capital investment in health care infrastructure. It includes both public and private spending on personal health care services.	OECD Prepared by authors

### Preliminary results based on SBM model

	2005	2006	2006 2007	2008	2009	2010	2011	2012	2013	2014	2005-2014	Average
	2005	2000	2007	2008	2009	2010	2011	2012	2013	2014	2003-2014	Rank
Austria	0.6313	0.6359	0.6347	0.6394	0.6511	0.6425	0.6474	0.6469	0.6605	0.6531	0.6443	20
Belgium	0.7775	0.7727	0.7628	0.7625	0.7710	0.7663	0.7449	0.7506	0.7619	0.7575	0.7628	16
Czech Rep.	0.8413	0.8390	0.8329	0.8370	0.8255	0.8331	0.7899	0.8018	0.7703	0.7688	0.8140	14
Denmark	0.8540	0.8540	0.8507	0.8528	0.8453	0.8440	0.8676	0.8700	0.9046	0.8962	0.8639	10
Estonia	1.1234	1.1265	1.1154	1.0739	1.0517	1.0517	1.0765	1.0879	1.0654	1.0449	1.0817	5
Finland	0.8807	0.8651	0.8550	0.8587	0.8658	0.8542	0.8236	0.8272	0.8223	0.8173	0.8470	12
France	0.7298	0.7314	0.7319	0.7365	0.7397	0.7299	0.7800	0.7835	0.7872	0.7834	0.7533	17
Germany	0.6666	0.6656	0.6634	0.6676	0.6709	0.6656	0.6628	0.6683	0.6748	0.6686	0.6674	19
Greece	0.7164	0.7178	0.7148	0.7022	0.7268	0.7129	0.7586	0.7833	0.8076	0.8249	0.7465	18
Hungary	0.7512	0.7641	0.7953	0.8205	0.8354	0.8144	0.8062	0.8088	0.8268	0.8311	0.8054	15
Latvia	0.8479	0.8551	0.8570	1.0965	1.0787	1.0863	1.1288	1.1387	1.1401	1.1254	1.0354	6
Luxembourg	1.0847	1.1087	1.1312	1.1238	1.1094	1.1213	1.2187	1.2036	1.2274	1.2412	1.1570	2
Norway	0.8219	0.8454	0.8292	0.8561	0.8257	0.8169	0.8849	0.8845	0.8775	0.8770	0.8519	11
Poland	1.1329	1.1184	1.0999	1.0834	1.1055	1.1059	1.0829	1.0876	1.0807	1.0793	1.0976	4
Portugal	0.8881	0.8967	0.8983	0.8978	0.9060	0.8958	0.9510	0.9737	1.0004	1.0064	0.9314	9
Slovak Rep.	0.8315	0.8198	0.8046	0.8450	0.8150	0.8125	0.8280	0.8180	0.8391	0.8629	0.8276	13
Slovenia	1.0409	1.0332	1.0233	1.0273	1.0240	1.0309	1.0275	1.0277	1.0162	1.0155	1.0267	7
Spain	1.0199	1.0111	0.9672	0.9452	0.9450	0.9293	1.0375	1.0418	1.0520	1.0484	0.9997	8
Sweden	1.2654	1.2870	1.2655	1.2969	1.2679	1.2798	1.4590	1.4979	1.4979	1.4979	1.3615	1
United King.	1.1223	1.1099	1.0978	1.1001	1.0941	1.0920	1.1296	1.1324	1.0925	1.0925	1.1063	3
Average	0.9014	0.9029	0.8965	0.9112	0.9077	0.9043	0.9353	0.9417	0.9453	0.9446	0.9191	

## Next research and main questions

- Using Novel DEA models
  - Emrouznejad and Amin (2007)
  - Olesen et al. (2014, 2016)
    - Models with ratio inputs and outputs
  - Ozcan and Khushalani (2016)
    - Dynamic Network Data Envelopment Analysis

• Compare results of traditional DEA models and Novel DEA models

### Thank you for your attention.

## Unconventional Monetary Policy Impact on Foreign Exchange – Evidence From the EU

**TECHNICAL UNIVERSITY OF KOŠICE Faculty of Economics, Department of Finance** 

> INTERREG Herl'any 17th May 2018

Renáta Rodáková

Leoš Šafár

# Smart communities

Community A

### Community B

### Community C

### ... what do they have in common?



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2

"This crisis started in the developed world. It will not be overcome ... through ... quantitative easing policies that have triggered ... a monetary tsunami, have led to a currency war and have introduced new and perverse forms of protectionism in the world."

(President Rousseff of Brazil, 2012)



"It's complicated... So's quantitative easing. But I still get that it means printing money."

(Jojo Moyes, 2012)



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4



Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. Believe me, it will be enough.

Mario Draghi



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# ECB

#### **UMP programmes**

- 2008 2015
- Long-term refinancing operation,
- Targeted LTRO
- Asset-backed purchase programme

Etc...

#### QE

- 2015 ?
- Already more than  $\notin 2.2$  tn







**INTERREG 2018** 

Leoš Šafár, Renáta Rodáková

# Event study (MacKinlay, 1997; Brown & Warner, 1985)

$$A_{AD} = R_{AD} - \bar{R}_{t} (1) \qquad \bar{R}_{t} = \frac{1}{60} \sum_{t=-60}^{-1} R_{t} (2)$$

•  $A_{AD}$  represents excess return on announcement day (AD) of particular index,

- $R_{AD}$  is return of particular index on announcement day calculated as difference between closing prices on announcement day and previous day,
- $\overline{R}_t$  is average return on particular index considering sixty days before announcement,
- $R_t$  represent daily return



# Events

Note: ECB – European Central Bank; MPD-GC – Monetary Policy Department, Governing Council

Source: own elaboration using data from ECB

Date	Event	Description
08.03.2018	ECB press conference MPD-GC	EAPP 30B/m till 9/2018
25.01.2018	ECB press conference MPD-GC	EAPP 30B/m till 9/2018
14.12.2017	ECB press conference MPD-GC	EAPP 60B/m -> 30B/m from 1/2017
26.10.2017	ECB press conference MPD-GC	EAPP 60B/m -> 30B/m from 1/2018
07.09.2017	ECB press conference MPD-GC	EAPP 60B/m
20.07.2017	ECB press conference MPD-GC	EAPP 60B/m
08.06.2017	ECB press conference MPD-GC	EAPP 60B/m
27.04.2017	ECB press conference MPD-GC	EAPP 60B/m
09.03.2017	ECB press conference MPD-GC	EAPP 80B/m -> 60B/m from 4/2017
19.01.2017	ECB press conference MPD-GC	EAPP 80B/m -> 60B/m from 4/2017
08.12.2016	ECB press conference MPD-GC	EAPP 80B/m -> 60B/m from 4/2017
20.10.2016	ECB press conference MPD-GC	EAPP 80B/m
08.09.2016	ECB press conference MPD-GC	EAPP 80B/m
21.07.2016	ECB press conference MPD-GC	EAPP 80B/m
02.06.2016	ECB press conference MPD-GC	Corporate sector purchasing programme (CSPP)
21.04.2016	ECB press conference MPD-GC	EAPP 80B/m
10.03.2016	ECB press conference MPD-GC	EAPP 80B/m from 4/2016
21.01.2016	ECB press conference MPD-GC	EAPP 60B/m
03.12.2015	ECB press conference MPD-GC	EAPP 60B/m
09.11.2015	press release	Public sector purchasing programme (PSPP)
22.10.2015	ECB press conference MPD-GC	EAPP 60B/m
23.09.2015	press release	Asset backed purchase programme (ABSPP)
16.07.2015	ECB press conference MPD-GC	EAPP 60B/m
03.06.2015	ECB press conference MPD-GC	EAPP 60B/m
15.04.2015	ECB press conference MPD-GC	EAPP 60B/m
05.03.2015	ECB press conference MPD-GC	Revealing details about private sector purchases
22.01.2015	ECB press conference MPD-GC	Expanded asset purchase programme (EAPP) 60B/m



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	Date	Hungaria n Forint	Polsky Zloty	Danish Krona	Romanian Leu	Bulgarian Lev	Czech Crown	Croatian Kuna	Sweden Krona	Australian Dollar	Chinese Yuan	Japanese Yen	Grt. Britain Pound	United States Dollar	Russian Ruble
	08.03.2018	-0,04	-0,08	-0,03	0,76	0,02	-0,01	0,13	-0,43	-0,42	-0,58	-0,69	-0,21	-0,92	-
Rogulta	25.01.2018	-0,05	-0,18	-0,02	0,18	-0,01	-0,11	-0,07	-0,17	0,32	-0,88	0,00	0,63	-0,22	-0,41
Tresuits	14.12.2017	-0,08	0,20	0,03	-0,04	-0,02	0,20	-0,08	-0,19	-0,87	-0,55	-0,56	-0,50	-0,41	-0,04
	26.10.2017	0,19	0,35	0,00	-0,04	0,03	0,36	0,01	0,18	-0,87	-1,29	-1,21	-0,58	-1,37	-1,02
	07.09.2017	-0,24	-0,02	-0,01	0,05	-0,01	0,09	0,05	0,16	0,30	0,29	0,09	0,40	0,79	-0,14
	20.07.2017	-0,22	0,07	-0,01	0,00	0,01	-0,08	-0,08	0,03	0,92	1,04	0,83	1,26	0,99	0,45
Note:	08.06.2017	-0,21	-0,21	0,00	-0,08	-0,03	0,00	0,24	-0,19	-0,44	-0,38	-0,24	-0,33	-0,47	-0,36
Excess changes bigger	27.04.2017	-0,33	-0,03	-0,01	-0,08	-0,02	0,49	0,18	0,52	-0,18	-0,22	-0,06	-0,72	-0,30	-0,56
than 1% in absolute	09.03.2017	0,22	0,43	0,03	0,12	0,00	0,01	0,05	0,28	0,64	0,33	0,90	0,32	0,34	1,20
value are shown in	19.01.2017	0,31	0,16	-0,01	0,11	-0,01	0,01	-0,15	0,30	-0,44	0,79	0,35	-0,33	0,32	0,72
grey;	08.12.2016	0,38	0,16	0,02	0,00	0,01	0,08	-0,03	-0,72	-0,91	-1,27	-1,15	-0,97	-1,21	-1,20
Table is divided by line	20.10.2016	0,15	0,32	-0,02	0,09	-0,01	0,05	-0,01	-0,01	0,91	-0,29	0,15	-0,22	-0,39	0,01
and outside the EU	08.09.2016	0,04	0,19	-0,04	0,11	0,00	-0,01	0,02	0,14	0,61	0,17	0,95	0,39	0,20	-0,04
	21.07.2016	-0,23	-0,31	0,02	-0,05	-0,02	-0,01	-0,03	-0,05	-0,14	0,05	-0,81	-0,20	0,12	1,20
Source: own	02.06.2016	-0,36	-0,05	0,00	-0,05	0,01	-0,02	-0,14	0,08	-0,01	-0,22	-0,92	-0,39	-0,34	-0,41
elaboration using daily	21.04.2016	0,39	1,29	0,00	0,08	-0,01	0,01	-0,14	0,09	0,75	0,08	-0,36	-0,05	-0,12	2,59
changes data on	10.03.2016	0,71	0,30	-0,02	0,06	0,01	0,00	0,03	0,81	2,70	1,46	1,47	1,06	1,60	2,36
investing com	21.01.2016	-0,12	-0,08	-0,04	-0,10	-0,03	0,00	0,01	-0,52	-1,47	-0,13	0,62	-0,46	-0,10	1,10
investing.com	03.12.2015	0,97	1,17	0,00	0,02	-0,02	0,12	-0,11	0,79	2,76	3,27	2,55	1,76	3,77	3,27
	09.11.2015	-0,37	-0,44	0,02	0,03	0,00	0,09	0,00	-0,29	0,08	0,26	0,17	-0,38	0,13	0,14
	22.10.2015	-0,44	-1,00	-0,02	-0,13	-0,03	0,01	-0,01	-0,60	-2,05	-2,02	-1,44	-1,94	-2,11	-2,86
	23.09.2015	0,33	0,55	0,08	0,03	0,04	0,34	-0,22	0,96	1,68	0,65	0,74	1,32	0,57	1,44
	16.07.2015	-0,14	-0,46	0,01	-0,38	0,00	0,14	0,16	-0,17	-1,12	-0,69	-0,43	-0,48	-0,71	-0,81
	03.06.2015	0,19	1,12	-0,07	-0,23	-0,06	0,00	-0,24	-0,67	0,83	1,43	1,05	1,83	1,72	3,98
	15.04.2015	1,31	0,29	0,02	0,33	0,02	0,50	-0,03	-0,14	-0,43	0,27	0,20	-0,05	0,39	-1,48
	05.03.2015	-0,20	-0,19	-0,05	-0,20	0,01	-0,71	-0,27	-0,28	0,07	-0,39	0,09	-0,15	-0,27	-1,46
	22.01.2015	-0.93	-1.06	0.12	-0.26	0.01	-0.31	-0.11	-1.45	-1.28	-2.04	-1.55	-1.20	-1.97	-2.40

Currency pair - Euro vs.:



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10

# Conclusion

- Within the EU?
  - low, insignificant impact
- Outside the EU?
  - announcing, continuing or prolonging in general negative for Euro
  - tapering in general positive for Euro
- Decreasing volatility in general



# Thank you for your attention



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# Measuring the potential of green city: Case study from Slovakia

Miriam Šebová, Lucia Paľuchová Faculty of Economics Technical University of Košice



### Introduction

- Cities play central role in the transition to more sustainable development.
- Good governed cities use synergies between enviromental, economic and social inclusion policies in transition to low corbon economies.
- The progress in the transition need be measured and evaluated at the local level.

### **Objective and methodology**

- The paper presents the local green index based on the available quantitative and qualitative indicators about cities in Slovakia.
- 2. It assess the "green" strategies in 8 biggest Slovak cities and rank them according the results of the constructed green index.

### **Theoretical background**

- Concept of green economy (Kenworthy, 2006); (McCormick, Richter, Pantzar, 2015)
- Concept of green city
  - Socia, economic and environmental dimension,
- Green city index,
  - European green city index (EIU, 2009),
  - Sustainable city index,
  - Sustainable city water index,
  - Environmental sustainability index.

### **Examples of best practises**

#### • European green capital award

	Vitoria-Gasteiz (2012)	Nantes (2013)	Ľubľana (2016)
Greenery	• 45 m <sup>2</sup> per capita	• 37 m <sup>2</sup> per capita	• 542 m <sup>2</sup> per capita
Mobility	<ul> <li>97 km (city) + 91 km (outside city) cycling routes</li> <li>bike sharing</li> </ul>	<ul><li> 225 km cycling routes</li><li> bike sharing</li></ul>	<ul><li> 230 km cycling routes</li><li> bike sharing</li></ul>
Water management	<ul> <li>2001-2009 decrease of water consumption 20%</li> </ul>	<ul> <li>decrease of water consumption</li> </ul>	
Air polution	<ul> <li>Decrease of air pollution</li> </ul>	<ul> <li>High air quality</li> </ul>	Improvement of air quality
Energy management	<ul> <li>Support of renewable energy sources</li> <li>3 wind power plants</li> </ul>	<ul> <li>Support of renewable energy sources</li> </ul>	<ul> <li>Support of renewable energy sources</li> </ul>
	<ul> <li>improving the energy efficiency of old and new buildings</li> </ul>	Development of brownfields	<ul> <li>improving the energy efficiency of buildings</li> </ul>
Waste management	<ul> <li>support for separate waste collection</li> <li>new chemical-biological cleaner</li> </ul>	<ul> <li>Recycling 35%</li> <li>recovering energy by burning 54%</li> </ul>	<ul> <li>high recycling of households</li> <li>extensive systems and coverage of organic waste collection</li> </ul>

### **Green indicators**

#### Selected indicators from 8 Slovak cities

Dimension	Quantitative indicators	Qualitative indicators
Air pollution	<ul> <li>Annual average NO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>, SO<sub>2</sub></li> <li>maximum hourly concentration NO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>, SO<sub>2</sub></li> </ul>	<ul> <li>Strategic documents</li> </ul>
Energy		<ul><li>Strategic documents</li><li>Solar panels</li></ul>
Mobility	<ul> <li>share of low-emission urban transport vehicles</li> <li>annual share of passengers using public transport</li> <li>the size of the public transport network, the share of cycling network to the total area of the city</li> </ul>	<ul> <li>Strategic documents</li> <li>Car a Bike sharing</li> <li>elektromobils</li> </ul>
Waste	<ul> <li>Communal waste per capita TKO in kg</li> <li>Share of energy recovery waste on communual waste in kg</li> </ul>	<ul> <li>Strategic documents</li> </ul>
Water	<ul> <li>Total consumption of drinking water per capita in m3</li> <li>Household water consumption per capita in m3</li> <li>% - to water leakage</li> </ul>	<ul> <li>Strategic documents</li> </ul>
Greenery	<ul> <li>The share of urban greenery in the total area of the city</li> <li>Urban greenery per capita in m2</li> </ul>	<ul> <li>Strategic documents</li> </ul>

### Comparison of cities City mobility



#### Index of green city How to calculate it?

- 1. Variation coefficient
- 2. Calculation of weights for individual variables.
- **3**. Composite indicator for the selected dimension.
- 4. Composite indicator score 1-8 b.
- 5. The city scores ranking in the Green City Index.

#### Green city index result 8 biggest cities in Slovakia

	Air pollution	Mobility	Waste	Water	Greenery	Points	Ranking
KE	6	3	2	6	8	25	3.
РО	4	2	4	7	2	19	7.
BA	7	8	3	1	1	20	6.
TT	1	6	5	3	7	22	4.
NR	8	5	7	2	6	28	1.
TN	3	1	6	8	3	21	5.
ZA	2	7	1	4	5	19	7.
BB	5	4	8	5	4	26	2.

### **Results**

#### Strenghts and weaknesses

	Air pollution	Mobility	Waste	Water	Greenery	Points	Ranking
KE	6	3	2	6	8	25	3.
РО	4	2	4	7	2	19	7.
BA	7	8	3	1	1	20	6.
TT	1	6	5	3	7	22	4.
NR	8	5	7	2	6	28	1.
TN	3	1	6	8	3	21	5.
ZA	2	7	1	4	5	19	7.
BB	5	4	8	5	4	26	2.

Legend:

Nadpriemer (8-6 points)

Average (5-4 points)

Below average (3-1 points)

### Conclusion

- Problems with datas,
- the need to measure the progress of the Slovak Republic's green agenda,
- problematic areas:
  - emissions, intensity and CO2 reduction,
  - energy consumption and consumption of renewable energy of the city,
  - energy intensity,
  - standards for the energy efficiency of buildings.
- the resulting index can be further improved.
# Thank you for attention

## Socio-economic resilience and vulnerability of regions

#### Monika Šiserová, Oto Hudec

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Research during the PhD. Study at Faculty of Economics, Technical University of Košice

17. May 2018

#### Motivation and aim of research

- The main aim of the research is to analyze the concept of spatial resilience of the regions to external economic shocks at the level of LAU 1 districts in Slovakia, to examine the impact of selected factors on the resilience of the regions and to create a comprehensive approach to analyse the resilience of the regions against the impact of external shocks.
- The main motivation was the absence of a comprehensive view on the issue of resilience and vulnerability of EU regions with an emphasis on Slovakia, the absence of the development of internal factors affecting the resilience of regions,
  - personal interest in sustainable development and related trends and future developments.

#### Resilience

- Extreme events such as financial crises, terrorist attacks and natural disasters have given rise to plenty of studies exploring the response capacity of a system to external shocks (Gunderson and Holling, 2002; Hutter et al., 2011; Pelling, 2011).
- Resilience should be understood as a multifaceted concept, including ecologic and economic disruptions such as slow acting and long-lasting processes of recovery (Pendall et al., 2010).
- Most of the new definitions of regional resilience refer to the idea of the ability of a local socio-economic system to recover from an external disruption or shock (Foster, 2007; Hill, 2008).

# Partial goals of research

## Partial goals of research

- 1. To identify and quantify the factors of the regional resilience capacity of Slovakia at the level of LAU 1 districts.
- 2. Analyze the impact of external economic shocks on Slovakia at LAU 1 level.
- 3. Analyze the internal factors of the regions affecting the socio-economic vulnerability of Slovakia at LAU 1 level to the global economic crisis.

# 1. Partial goal

To identify and quantify the factors of the regional resilience capacity of Slovakia at the level of LAU 1 districts.

# What is resilience capacity?

the ability of the region to respond to future shocks, i.e. the expected resilience (Foster, 2007)

#### Resilience capacity – data and methodology

- The Resilience Capacity Index (RCI) developed by Foster (2007) is used to examine the resilience capacity of the Slovak districts.
- The RCI is a compound of 12 variables aggregated into three categories:
  - Regional Economic attributes;
  - Socio-Demographic attributes;
  - Community Connectivity attributes.
- z-scores were used to set all the indicators on one scale
  - mean of zero and standard deviation of one
  - positive (above the mean) or negative (below the mean)
- Sources of data
  - Database of Statistical Office of the Slovak Republic; Slovak real estate portal; Business Alliance of Slovakia; Population and housing census 2011; Central Office of Labor, Social Affairs and Family and Ministry of Interior of the Slovak Republic, Public Administration Section.

$$z = \frac{X - \mu}{\sigma}$$

Res	Silience capacity ECONOMIC CAPACITY	<ul> <li>1.5</li> <li>1.0</li> <li>0.5</li> <li>0.0</li> <li>-0.5</li> <li>-0.5</li> <li>-0.5</li> <li>-1.0</li> </ul>					
	A.1.income	Fig. Economic capacity in the 79 Slovak districts. Legend: darker colours indicate higher values of subindex and represent better resilience capacity. Source: author's own processing					
	A.2. affordability of	District	RCI 1	A.1.	A.2.	A.3.	A.4.
	housing	Bratislava II	1,4591	1309,80	1,36	0,78	4,48
	A.3.diversification of economy	Bratislava I	1,1974	1260,80	, 1,38	0,59	4,42
		Medzilaborce	1,1461	652,20	2,81	3,25	2,90
		Žarnovica	1,0084	836,20	2,49	1,85	3,40
	A.4.business environment	Bratislava IV	0,8863	1152,60	1,44	0,68	4,07
		National average		784,19	1,32	1,25	3,36



## **Resilience capacity**

#### COMMUNITY CONNECTIVITY CAPACITY

#### C.1.civic infrastructure



Fig. Community connectivity capacity in the 79 Slovak districts. Legend: darker colours indicate higher values of subindex and represent better resilience capacity. Source: author's own processing

**C.2.**resident stability

C.3.home ownership

**C.4.voter participation** 

District	RCI 3	C.1.	C.2.	C.3.	C.4.
Bratislava I	1,1243	46,96	68,39	0,77	0,63
Kysucké Nové Mesto	0,8123	4,19	90,93	0,91	0,53
Svidník	0,7093	27,03	87,96	0,83	0,45
Zlaté Moravce	0,6512	6,05	90,12	0,88	0,54
Tvrdošín	0,6413	4,85	90,52	0,90	0,50
National average		7,22	85,78	0,85	0,47

#### **Resilience capacity**





## 2. Partial goal

# Analyze the impact of external economic shocks on Slovakia at LAU 1 level.



**Graph**. Development of the unemployment rate in Slovakia in the period 2001-2016 (%)

Beginning of 90's – 2007 – "long boom"

#### Vulnerability

- Vulnerability in regional science is related to resilience (not opposite), and usually means the exposure to shocks.
- It represents the structural characteristic of the region generated by multiple factors and processes. (Briguglio, 2004)
- Resilience is explained as the capacity of a system to rebound after a shock, while vulnerability is about the **susceptibility** (sensitivity) of the system to external shocks. (Seelinger and Turok, 2013)
- Economic vulnerability can be measured as unemployment change (Champion and Townsend, 2012; Lee, 2013)

#### Socio-economic vulnerability – data and methodology

- Index of socio-economic vulnerability in the first period of crisis (2007–2012).
- Index of socio-economic recovery in the second period of the crisis (2012-2016).
- Calculation of socio-economic vulnerability based on unemployment data at the level of the districts of the SR (LAU1).
- Main source of data database of monthly statistics of the Office of Labor, Social Affairs and Family in years 2001-2016
- Indices are measured using a relative change in unemployment and are based on the Lagravines Resistance Index (Lagravinese, 2015), based on Ron Martin's studies and it is more suited to the conditions of Slovak districts (Martin, 2012):

$$\lambda = \left[ \left( \Delta X_d / X_d \right) - \left( \Delta X_N / X_N \right) / \left| \Delta X_N / X_N \right| \right]$$

- Spatial analysis: Global and local Moran index of spatial autocorrelation
  - A matrix of spatial scales based on the 6-nearest neighbors

## Socio-economic vulnerability of Slovak districts



**Obr**. Moran map of significance for economic vulnerability between years 2007-2012

**Note:** Red color represents a worse district reaction compared to other districts; blue color represents a better reaction of the district compared to other districts

# 3. Partial goal

Analyse the internal factors of the regions affecting the socioeconomic vulnerability of Slovakia at LAU 1 level to the global economic crisis.

#### Selected factors

- Diversity of economic sectors (Davies and coll., 2010; Hill and coll., 2008; Gordon, 2012)
- Business environment (Foster, 2007; Tierney, 2007)
- Human capital (Faggian and McCann, 2009; Gennaioli and coll., 2013)
- Social capital (Capello and Faggian, 2005; Di Giacinto and Nuzzo, 2006)
- Accessibility (Östh and coll., 2014)

#### Main methods

- Hirschman–Herfindahl index (HHI)
- Moran index of spatial autocorrelation
- spatial autoregressive model (SAR)
- spatial error model (SEM)
- Used software
  - Software R

## Variables in models

- Explanation variable: vulnerability index in the first period of the economic crisis (2007-2012) in the districts of SR
- Explanatory variables:

Variable abbreviation Variable description				
[EK.DIV]	Economic sectoral diversity (index)			
HHI on the basis of employmen	t in the sectors: heavy industry, light industry, construction, trade and			
transport, other business services and the public sector				
[BUS.ENV] Business environment (index)				
expressed using the index of the regional business environment, which expresses the quality of business				
conditions (Business Alliance of Slovakia)				
[HIGH.EDU]	Higher education (ratio)			
ratio of the population of the district over 25 years with higher education I., II. or III. degree to the				
population of the district over 25 with lower than university education				
[CIV.INFR] Civil infrastructure (per capita)				
calculated on the basis of the number of civic organizations in the district in proportion to the population of				
district				

## Variables in models

#### • Explanatory variables :

Variable abbreviation	Variable description			
[EL.PART]	Participation in elections (per capita 18+)			
the proportion of eligible voter	s, ie citizens over 18 who participated in the last parliamentary elections in			
2006 out of the total number o	f eligible voters			
[DENS.ROAD]	Density of the road network (km / km <sup>2</sup> )			
the sum of kilometers of roads	in the district, ie motorways, express roads, roads of the first, second and			
third classes in proportion to th	e area of the district			
factor (BA_NUTS2)	A categorical variable (1 = if the district is located in the region in question, 0 = if it is not located in the region)			
factor (ZS_NUTS2)	BA_NUTS2 – Bratislava region, ZS_NUTS2 – Western Slovakia, SS_NUTS2 – Central Slovakia			
factor (SS_NUTS2)	Eastern Slovakia = reference region			

## The following steps were needed to meet the goal:

- 1. Estimation of OLS model and detection of spatial autocorrelation.
- 2. Selection of a suitable spatial model.
  - SAR / **SEM** based on the log likelihood logarithm (LIK) and Akaike criteria (AIK) and the direct and indirect effects of the spatial autoregressive model
- 3. Estimating the spatial error model (SEM) and quantifying the effects of the variables (factors) on the explained variable.
- 4. Evaluation of the most important factors affecting socio-economic vulnerability.

Selected results of the analysis of internal factors of the regions affecting the socioeconomic vulnerability of Slovakia at LAU1 level to the global economic crisis

#### Spatial error model (SEM)

Explanatory variables	estimates(β)	standard deviation (SD)	p-value Pr(> z )	
Economic sectoral diversity	0.0501079	0.0022040	0.590539	
(EK.DIV)	-0.0301378	0.0932949		
Business environment	0 4096020	0 2166686	0 0/0216 *	
(POD.PR)	0.4080029	0.2100080	0.049310	
Higher education	0 0242579	0.0150000	0 104429	
(VYS.VZD)	0.0245578	0.0130009	0.104428	
Civil infrastructure	0 0000866	0.0007201	0.304674	
(OB.INFRA)	0.0099800	0.0097291		
Participation in elections	0.0018001	0.0016542	0 274161	
(VOL.U)	-0.0018091	0.0010545	0.274101	
Density of the road network	1 5 4 7 0 0 0 0	0 5002477	0.009830 **	
(HUST.CS)	-1.5470566	0.5992477		
Categorical variable – part of the Bratislava region	0 9575251	0 3593553	0.007709 **	
(factor(BA_NUTS2)	0.5575251	0.3333333		
Categorical variable – part of the region Western Slovakia	0.7173288	0.2420742	0.003044 **	
(factor(ZS_NUTS2)	0.7.270200	012 1207 12		
Categorical variable – part of the region Central Slovakia	0 2898431	0 2222173	0 192124	
(factor(SS_NUTS2)	0.2000 101	0.222217.5	0.192124	
Lambda: 0.56921				
AIC: 115.04				
Log likelihood: -45.52237				

**Note:** Significance codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1; the Eastern Slovakia region is a reference categorical variable

#### Significant factors of influence

- Density of the road network Positive impact on socio-economic vulnerability
  - It can be assumed that in the districts with good internal accessibility, the socio-economic impact of external economic shocks will be smaller - new jobs at a short time
- Business environment Negative impact on socio-economic vulnerability
  - Large companies based mostly on foreign investors open to the global market foreign demand
  - The primary impact of the crisis is the decline in demand for their products from world markets, and consequently their production decline
  - Secondary effects of economic shock are socio-economic
- Location in the Bratislava Region and Western Slovakia
  - Bratislava is the most developed center of Slovakia, which also makes it vulnerable to external economic crises
  - the expanding effects of Bratislava in the west, strong, towards the east weaker and weaker

#### Conclusions

- It is possible to increase the resilience of the regions: important active approach of all regional actors:
  - RAISING AWARENESS ABOUT THE CONCEPT OF RESILIENCE
  - RAISING AWARENESS ABOUT THE REGIONAL RESILIENCE CAPACITY it is not a guarantee of the region's effective response to the impacts of external threats, as it depends on the actors of territorial development to what extent they can exploit the potential
  - RAISING AWARENESS ABOUT THE SOCIO-ECONOMIC VULNERABILITY In the future decisions of national, regional or local development actors should help knowledge of the most vulnerable districts.

# Thank you for your attention.

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#### Hirschman–Herfindahl index

 Základný HHI je vyjadrený ako suma štvorcov podielov zamestnanosti v odvetvovej štruktúre v danom regióne vzhľadom na celkovú zamestnanosť alebo na zamestnanosť vo zvyšných odvetvových štruktúrach (Henderson, 1997).

$$HHI = \sum_{i=1}^{N} s_i^2$$

Možné intervaly hodnôt indexu:

ННІ	Úroveň diverzifikácie	
< 0,01 dokonalá konkurencia		
0,01 - 0,15	silná diverzifikácia	
0,15 - 0,25	mierna diverzifikácia	
> 0,25	slabá diverzifikácia	

## Model s priestorovými chybami (SEM),

- Priestorový model, ktorý sleduje priestorové spillover efekty.
- Model SAR je možné vyjadriť vzťahom:

$$y = \lambda W y + X \beta + u$$

kde:

y = vysvetľovaná premenná,

- $\lambda$  = priestorovo autoregresný koeficient,
- W = matica priestorových váh,
- X = matica vysvetľujúcich premenných,
- $\beta$  = vektor koeficientov,
- *u* = náhodná chyba.

## Appendix

A. ECC	NOMIC CAPACITY
<u>A.1.</u> Ind	come equality
<u>A.2.</u> Ec	onomic diversification
<u>A.3.</u> Af	fordability
<u>A.4.</u> Bu	siness environment
B. SOC	CIO-DEMOGRAPHIC CAPACITY
<u>B.1.</u> Ed	ucational attainment
<u>B.2.</u> Th	e without disability
<u>B.3.</u> Th	e out of poverty
<u>B.4.</u> He	alth-insured
C. CON	MUNITY CONNECTIVITY CAPACITY
<u>C.1.</u> Civ	vic infrastructure
<u>C.2.</u> M	etropolitan stability
<u>С.З.</u> Нс	me ownership
<u>C.4.</u> Vo	ter participation

## A Economic capacity

#### A.1. Income equality

- **ORIGINAL SPECIFICATION:** The inverse Gini is calculated using individual level registers of disposable income cumulated at the municipality level.
- **SLOVAK SPECIFICATION:** The income equality is calculated using the average nominal monthly wage at the district level in years 2010-2014.
- Source: Statistical office of the Slovak Republic

## A Economic capacity

#### A.2. Economic diversification

- ORIGINAL SPECIFICATION: In the index, the vulnerability is expressed as the local deviation from the national industrial mix in terms of the number of employees in the manufacturing, service and public sectors. The standardized inverse share of deviation is used to calculate the RCI-index.
- **SLOVAK SPECIFICATION:** In the index, resilience is expressed as the local deviation from the national industrial mix in terms of the number of employees in the manufacturing, service and public sectors in year 2014. The standardized inverse share of deviation is used to calculate the RCI-index.
- Source: Statistical office of the Slovak Republic



## A Economic capacity

#### A.3. Affordability

- **ORIGINAL SPECIFICATION:** Affordability is measured as the share of the regional population spending less than 35% of their income on housing.
- **SLOVAK SPECIFICATION:** The Slovak specification uses the median nominal monthly wage at the district level and the average price for one-room, two-room and three-room flats also at the district level in year 2014. By dividing the median nominal monthly wage by the average housing price, the affordability can be assessed. The resulting values are higher in areas with greater affordability. The standardized quota is used to calculate this component of the RCI-index.
- Source: Statistical office of the Slovak Republic, Slovak real estate portal


## A Economic capacity

#### A.4. Business environment

- ORIGINAL SPECIFICATION: The RCI Business Environment indicator is the "Economic Dynamics" sub-component of the Indiana Business Center's Innovation Index. Formulated as an index, it is a single number capturing the range of business conditions at the metropolitan region scale.
- SLOVAK SPECIFICATION: The Business Alliance of Slovakia annually ranks the business climate in Slovakia but only at the national level (Business environment index) with the exception of 2011 when the rank was made at the district level (Regional business environment index).
- Source: Business Alliance of Slovakia



#### **B.1. Educational attainment**

- **ORIGINAL SPECIFICATION:** The Slovak specification is identical to the original specification but at the district level.
- **SLOVAK SPECIFICATION:** The percentage of individuals aged 25+ with an education equal to or higher than a bachelor's degree divided by the percentage of individuals aged 25+ with no upper school education than a bachelor's degree in year 2011. The resulting values are high if the share of higher educated individuals is larger than the share of lower educated individuals, and vice versa. The standardized quota is used to calculate this component of the RCI index.
- Source: Population and housing census 2011



#### **B.2.** The without disability

- ORIGINAL SPECIFICATION: It is calculated as the percentage of a metropolitan area's civilian non-institutionalized population that report no sensory, mobility, self-care or cognitive disabilities. Data come from the 2009 American Community Survey 1-year estimates, table B18101 (disability status).
- **SLOVAK SPECIFICATION:** It is calculated as the percentage of a district area's population that receives contributions to compensate severe disability in year 2014. The inverse measure calculated from this percentage is used as an indicator.
- Source: Central Office of Labor, Social Affairs and Family



#### **B.3.** The out of poverty

- ORIGINAL SPECIFICATION: The indicator captures the percentage of the population with income in the past 12 months above the federally defined poverty line. Data come from the 2009 American Community Survey 1-year estimates, table B17001 (poverty status in the past 12 months) from which the inverse measure is calculated.
- **SLOVAK SPECIFICATION:** The out of poverty indicator measures the district share of the population having a greater annual income than what is defined as the poverty line in year 2013. Within the European Union, the poverty line is defined as having a disposable income of less than 60% of the median disposable income in the country.
- Source: Statistical office of the Slovak Republic

#### **B.4. Health-insured**

- **ORIGINAL SPECIFICATION:** The percentage of the metropolitan area's civilian non-institutionalized population that report having health insurance coverage, including both public and private insurers.
- SLOVAK SPECIFICATION: Because the Slovak health care system is compulsory, the original Health-Insured indicator makes little sense in the Slovak context. Aggregated to the district level, the percentage of incapacity for work is used to calculate the RCI-index. This percentage is calculated as the proportion of the number of calendar days of incapacity for work due to disease or injury to the average number of health insurance, multiplied by the number of calendar days in the year 2014. The Slovak specification is not similar to the original specification.
- Source: Statistical office of the Slovak Republic

#### C.1. Civic infrastructure

- ORIGINAL SPECIFICATION: Civic Infrastructure is a measure of the density of civic organization employees in a region. The share of all employees in any municipality employed by civic organizations, classified according to NACE-2 as being either political, religious, sports-oriented or other (including but not limited to organizations focusing on folklore, literature, music and arts, societies, and horticulture), is used as an indicator of civic infrastructure.
- SLOVAK SPECIFICATION: Civic infrastructure is measured by the number of civic organizations in a district, classified according to NACE-2 as being either political, religious, sports-oriented or other (including but not limited to organizations focusing on folklore, literature, music and arts, societies, and horticulture) in year 2015.
- Source: Ministry of Interior of the Slovak Republic, Public Administration Section

#### C.2. Resident stability

- **ORIGINAL SPECIFICATION:** The share of population that remains resident in the municipality over a five-year period. The greater the share of long-duration stayers, the greater is the collective knowledge on how to cope with shocks locally.
- **SLOVAK SPECIFICATION:** The share of population that remains resident in the municipality over a five-year period (2010-2014). The greater the share of long-duration stayers, the greater the collective knowledge is on how to cope with shocks locally.
- Source: Statistical office of the Slovak Republic

Spatial economic resilience and vulnerability: The case of Slovakia



#### C.3. Home ownership

- **ORIGINAL SPECIFICATION:** The Slovak specification is identical to the original specification.
- **SLOVAK SPECIFICATION:** The share of the population residing in owner-occupied housing in each municipality in year 2011.
- Source: Population and housing census 2011



#### C.4. Voter participation

- **ORIGINAL SPECIFICATION:** The Slovak specification is identical to the original specification.
- **SLOVAK SPECIFICATION:** The share of the voter-eligible population that voted in the last (national) election in year 2012.
- Source: Statistical office of the Slovak Republic

## The Importance of Regional Development in the Office of Košice self-governing region

Herľany 17.5.2017

Ing. Peter Ťapák Košice selfgoverning regio

# Why a strategy for Smart Region?

# **Context and issues**

GOOD

**GOVERNANCE** &

**EFFECTIVE SUPPORT** 

SMART SPECIALIZATION

**CASE KSR** 

INNOVATION ECOSYSTEMS :



#### **Spatial economic structure KSR**



# District unemployment rate



# What is a smart social system?

Smart organisations and social systems are dynamically adaptive to new circumstances, **innovative** and knowledge-driven, strategically minded, internetworked, learning as well as agile in their ability to create and effectively exploit the opportunities offered by the new trends in order to responsibly achieve the preferred development objectives.

# Smart social system



# Smart public governance

Is defined as governance that enables a social system and its subjects to operate effectively in a fast changing and complex environment rationally utilizing its internal and external resources, making pragmatic and advanced decisions relevant to specific circumstances in order to create shared public value

# The concept of smartness









## Capacities needed for Košice region to move from 'disconnected' to 'connected'



# **Key principles of smart development**

- 1. Employing **uncommon sense** for discovering the approaches, methods and resources for the development.
- 2. <u>Creation of ecosystem favourable for creativity,</u> <u>innovations and entrepreneurship</u>
- 3. Employing the philosophy of shared value creation
- 4. Intelligence
- 5. Strategies targeted to achieve ambitious developmental goals
- 6. Creation of co-operative community culture
- 7. Decision making is grounded on scientific knowledge and rethinking of best practices
- 8. Extensive use of ICT in all spheres of social system
- 9. Empowering of individual and organisational learning **10.Networking**
- 11.Sustainable development



# Expected completion of motorways advantage of Košice –transport HUB



#### Amelioration of spatial-economic structures Kosice - impact

area

**KOŠICE** REGION





Wide-gauge railway line the biggest continental port in Slovakia New multimodal Terminal in Košice

International airport Košice With logistic park

Highway system in Slovakia between Košice and Prešov







#### Industrial& technology parks in Košice agglomeration



## Create regional educational ecosytem for developpment Industry 4 in the region and co-inclusive labor market







# The network of engineering and electrical engineering Schools in KSR





- We have 21 technical and appretince schools with 2012 students in the first and fourth year related to machinary & automotive industry section 23, 26 and
- 17 schools with 2169 students related to mechanic
   & electrician section(26)
- We have 2 core Training center (TC) for machinery a automotive and 3 broader TC

# The university education ecosystem













## TRAINING CENTERS FOR DEVELOPMENT INDUSTRY4.

Mechatronics	NC Technologies & Robotics	Automated Production Systems	Application of New Materials and Tribotechnology
<ul> <li>System integrator of mechatronic drives of robotic and technology equipment</li> <li>Designer and operator of check information and control systems for mechatronics</li> </ul>	<ul> <li>Designer, operator of robotic equipment and automated production systems</li> <li>Designer, operator of service robotic equipment and NC machines</li> </ul>	<ul> <li>Designer, operator of automated production systems</li> <li>The designer, operator of control-information and management systems of APS</li> </ul>	<ul> <li>Development technologist for application of new materials</li> <li>Tester, diagnostician for the area of tribotechnology processes</li> </ul>





# Innovation Ecosystem System Development in KSR





#### University of KSK and centers of excellence



# PROMATECH

- PROMATECH the Research Centre of Advanced Materials and Technologies creates a realistic platform for the development of cooperation between the academia and industry in the field of applied material research
- PROMATECH include
- a Laboratory for the preparation of powdered and pressed samples applications,
- a Laboratory of magnetic features Laboratory of scanning scope microscopy STM and AFM (research on the mechanical, tribological and electric features of materials with nanometric resolution,
- a Low-temperature nanotechnology laboratory of magnetic features of materials
- A Nanotechnology laboratory for the preparation of nanocomponents for electronic devices, sensors, and environmental applications,





#### Strategic Hi- Technology park Kechnec in\_Košice agglomeration




### Industrial parks and business incubators in KSR





Industrial park in Spišská Nová Ves Industrial park in **Michalovce** Industrial park in Rožňava Industrial park in Trebišov Industrial park in Pereš Industrial park in **Krompachy** 



### **Business Services Centers in Košice**



Cassovar Košice



**VSH Business Centre** 



Galéria Košice



**BC** Tesla



#### Office center Eco Point

In cooperation with our partners bring more investment, more innovation, more high value jobs to the

Engineering and metalworking industries with higher added value The digital economy - ICT industry and Internet economy Tourism and creative industries Industry focused on energy saving and reuse of materials and Industry and services focused on care for people and the older generation

# Promote R & D, smart growth and innovation competence of SMEs and clusters in KSK





## Industry in Košice Region



 Industry and service sectore is mainly concentrated in the districts of <u>Kosice city</u>, <u>Michalovce and Spisska Nova Ves</u>

Industrial strength:	
Foreign direct investment(FDI, 2014)	6,3% (2,646 bln. €) from 42 bln. € (Bratislava region 69,99% FDI)
Type of industry	Steel, automotive, IT and chemical
Clusters	IT Valey, robotics and automation, CLS
Growth of IT sector is the biggest	6000 employees in 2010  expected 10 000 by 2020 538 companies in 2010  766 in 2014



## Towards ecosystem

**Entrepreneurial ecosystem** is a set of interconnected business companies, entrepreneurial organisations, research and public sector institutions which formally and informally coalesce to connect, mediate and govern the performance within the national/regional/local entrepreneurial environment employing the concept of shared value creation.

- Cluster as a nifty tool
- Cluster approach it is about entrepreneurial/ business ecosystem



### U.S. Steel Košice

one of the significant global business player and major employer of the region



### **T**–**Systems** Siginficant global player





/

#### Embraco Siginficant global player and mayor employer region Spiš





Východoslovenské železiarne



# Košice Region success story - Brazilian strategic manufacturer 2500 works with a network of subcontracting SMEs - approx with 500 working places





### Košice Region success story strategic U.S. Steel company

### employs 11,000 employees





#### Košice Region success story - High added value producers Getrag Ford -

#### Magneti Marelli -technology industrial park Kechnec-Košická agglomeration





#### Košice Region success story-IT Valley Association with

#### **45** Companies





Klaster AT+R, z.p.o.
STRUCTURE





### Clusters and supply networks in Košice region





# JIC Brno smart managment concept



## What we need ? Coaching program for chosen regional smart teams







### Our competencies

**Robotics - components** 



#### SPINEA

- High accuracy gears bearing reducers
- Embedded compact actuators
- Compact drive units
- TwinSpin
- DriveSpin















To promote green economy& education and spread digital technology B2B a B2C in rural areas





# Smart region –circular economy





# Chemko Strážske a.s.ECI CHEMKO

Košice Region

- In 1952 production of a manufacturing explosives for civil and military purposes
- In 1996 Production of explosives was abandoned
   unemployment > 2000.
- 2017 Chemko, a.s Slovakia (EnergoChemica)



- A subsidiary company produces top inorganic and organic chemistry products such *as light stabilizers* and *phenolic resins* 

- operates brown field industrial park
- 850 employee





This project has received funding from the European Union's Horizon 2020 research and innovation program under grant a greement No 709557





## **Project of 2<sup>nd</sup> generation bio-refinery**

**Košice Region** 

- Feedstock input 2 305 000 tones of lignin biomass
- Bio-products 25 000 tones of 2G ethanol, ethylene and ethylene oxide

Diogas 22 Millionm<sup>3</sup> -70% biomethane (power and heat production)

Jobs 2 1.phase – 135 green jobs (500 indirect)

2.phase – 45 green jobs (500 indirect)





## Investments

**Košice Region** 

- 21 M€ BIC/BBI grant <sup>[2]</sup> BIOSKOH project (ENERGOCHEMICA)
- Plans to build a largest 2G Bio-refinery Central Europe
  - To use innovative unique technology at European scale
  - To demonstrate a new regional bio-based value chain
  - To valorize side streams from cellulosic fractions
  - Creating estimated 160 direct and 500 indirect green jobs





# Smart Košice creative ecosystem RKC

# The ideal talent are creative problem solvers, but entrepreneurs are not fully



Q20. Beyond having the necessary technical qualifications for a job, what do you think are the main attributes companies arelooking for in candidates when considering them for a job application? Q21. Beyond having the necessary technical qualifications for the job, what are the main attributes you look for in candidates when considering them for a job application? Base business executives: 2,748. Base informed public: 1,346.



5 3

## KKC STROJÁRENSKÁ

NOVÉ FUNKČNÉ PRIESTORY PODĽA VYTVORENÝCH PROGRAMOV

OFFICE BLACKBOX – MALÁ SÁLA MULTI NUTECH LAB TANEČNÁ SÁLA, ŠKOLY MULTIFUNKČNÁ SÁLA KNIŽNICA SUTERÉN - SKÚŠOBNE SUTERÉN - STUDIO WORKSHOP ROOM – SEMINÁRNA MIESTNOSŤ OFFICE, SKÚŠOBNE **DABING STUDIO** PREZENTAČNÝ PRIESTOR KC – POP-UP FOTO ATELIER + FILM STUDIO POSPRODUKČNÉ ŠTÚDIO / AV LAB + SOUND SPACE **PRINT/PRESS LAB** FAB LAB / KEFA MAKERS LAB / ULUV COWORKING **DIELNE SOCHA DIELNE KOV DIELNE DREVO DIELNE GRAFIKA, TLAČ** ATELIER FASHION DIELNE, FASHION LAB? GAMES LAB **COMPUTER LAB** CORE LAB **MOTION CAPTURE** GALÉRIA





### Dizajn

### Scénické umenie

### Media Art

### Kultúrne dedičstvo/remeslá

Vizuálne umenie





VR AR FX 2D/3D UX/UI A/V DMX

# Performing






# Smart region

 Smart Region initiative. "smart cities" approach on a regional scale to enable a genuine impact on the socioeconomic development of urban ecosystems.



# Momentum for a Smart Region



# How to turn this Smart Region strategy into reality?

- Identify the needs and constraints expressed by the KSR cities in a perspective of sharing and pooling of experience
- Activate the "Advisors" to target their action in the framework of performance agreements serving the Smart Region strategy
- Enable the emergence of Smart Region projects in different vertical themes prioritized by cities
- Promote innovative modes of cooperation with enterprises by facilitating the transfer of skills to the benefit of cities
- Develop training for elected officials and agents within cities to increase digital skills

# How to turn this Smart Region strategy into reality?

- Tangible, open, scalable
- Public / private partnerships, a network that the local can connect to
- In a spirit of pooling / replicability
- Complementarity
- Focus on accelerate services
- An attractive force enabling "plug-in's"
- Take citizen issues in consideration
- Exploitation of data in back office





## CROSS BORDER CLUSTER INITIATIVES FOR ECONOMIC DEVELOPMENT SUPPORT

*Nataša Urbančíková* Technical University of Košice, Slovakia Faculty of Economics

- The growth of competitiveness of regions depends on their **capacity to innovate**.
- Peripheral regions are disadvantaged and because of their localization they have only few links with international networks in science, technology and innovation.
- Two target regions:
  - Košice Region in Slovakia
  - Zakarpatska region of Ukraine



- peripheral regions
- present level of GDP is below of 50% EU27 average



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 Innovations are increasingly based upon a "Triple Helix" of university-industrygovernment interactions.

 The Triple helix approach depends on the building of partnerships between various regional, local governments, universities, private sector and NGOs and is a key issue at both national and regional level, although it is not easy to manage the process.

 There are the difficulties during the triple helix approach implementation in the former postcommunist countries, including Slovakia and Ukraine. **Clusters** are geographical concentrations of mutually interconnected organisations, specialised suppliers, service providers, companies in related industrial branches and interconnected institutions (such as universities or business unions) that compete in the same area as well as cooperate.

Porter. 1990. "Competitive Advantage of the Nations"

- The <u>public sector</u> may significantly support formation and development of clusters via politics and programmes, that promote the knowledge exchange, lower the information and coordination failure and reinforce the cooperation between the companies as well as between the companies and the research institutions.
- Another option of cluster support from the side of public sector is the creation of political tools for cluster formation and development such as partnership of public and private sector for research and development. Within the regional politics, the clusters are often used as tools for gathering and activation of key participants in region.

- Among the most significant factors affecting the process of cluster formation in cross border regions:
- industry cooperation (business climate, innovation activity, etc.),
- interactions of governmental authorities (legal field of governance, level of governmental contribution, share in cluster initiatives, etc.)
- and cooperation in educational and R&D sectors (university partnerships, level of scientific and technological development of a cross -border region, etc.).

#### Clusters play a very important role in research, development and innovation (RDI) policy.

- not only traditional research and development (R&D) policy (a basic university research or typical regional development policy implemented by regional self-government etc.).
- Innovation policy is about helping companies to perform better and contributing to wider social objectives such as growth, competitiveness, jobs and sustainability (including specific sector innovation policy and programs).
- There are many tools available to achieve this, ranging from establishing supportive framework conditions (e.g. human resources, education, an internal market, intellectual property) to facilitating access to finance and enabling collaboration and stimulating demand.

#### The analysis was prepared on the basis of secondary and primary research.

- There are used not only available statistical data and other secondary information, but also the results of the qualitative research, which includes questionnaire surveys and structured interviews with representatives of **four target groups**:
- Regional and local authorities in both participating regions
- Institutions from the business sector
- Universities and RTD institutions in both regions
- Business support institutions (e.g. financial institutions, chambers of commerce and industry, brokering institutions, advisory centres)

- The representatives of four main target groups of the project were interviewed within three months
- The basic tools used for the questionnaire survey
  4 versions of questionnaires were distributed electronically and collected also personally.
- The prepared questionnaires were used as a scenario for a face-to-face semi-structured interviews (from both selected sector including all target groups).
- A total of 106 respondents participated in the survey (SK) and 39 (UA)
- Total 145 qquestionnaires in cross-border area.

- The research has been focused on two cross border peripheral regions
  - Košice Region in Slovakia
  - Zakarpatska region of Ukraine

These regions need to seek opportunities for economic development which are not based only on the foreign capital attraction.

The innovative potential of two converging and cross-border regions was examined and possibilities of cross-border clusters and cluster initiatives creation discussed.



The following analyses were prepared:

1. Analysis of economic and technological development in the partner regions.

2. Analysis of existing research and development policies, plans and activities at the regional level, including institutions to promote research and development.

3. Analysis of regional (subnational) capacity to produce, disseminate and use knowledge.

4. Analysis of public and private R&D institutions operating at regional level.

- 5. Analysis of small and medium-sized enterprises (SMEs) and large companies (LC) at the regional level, with significant potential and demand for research and development.
- 6. Analysis of existing resources (financial entities) adequate funding for science, research and innovation (RDI) in selected regions.
- 7. Regional analysis of the level of social capital in target regions, focusing on existing partnerships as a basis for future cross-border clusters and cluster initiatives.

 The proposed economic branches in each region were chosen according to:

- The branch's share in total employment.
- The branch's location quotient.
- The main production sector
- Regional priorities
- Existing institutional R&D and innovation support

#### • ICT

Food Industry sector

Secondary indicators comparing performance and competitivity of the Košice region and Trascarpathain region and the EU Source: Statistical Office of the Slovak Republic, Ukraine in Figures in 2011 - State Statistics Service of Ukraine and Eurostat

Indicator	Košice	East	Slovakia	Transcarpathi	Ukraine	EU-15	EU-27
	region	Slovakia		an Region			
Regional gross domestic	9 600 EUR	8 200 EUR	12 100	1 082 EUR	2 080 EUR	28 400	24 500 EUR per capita (2010)
product per capita (at current	per capita	per capita	EUR per	per capita	per capita	per capita	
prices) by territory (EUR)	(EUR) (2010)	(EUR)	capita	(EUR) (2010)	(EUR)	(2010)	
	11,33 %	(2010)	(2010)		(2010)		
	share of						
	region in the						
	SR (2010)						
Registered unemployment rate	19,6 %	18,1 %	13,1 %	1,8 %	2,0 %	9,3 %	9,3 % (2011)
by territory (in %)	(2011)	(2011)	(2011)	(2010)	(2010)	(2011)	10,1 % (2012)
		18,4 %	13,6 %	1,6 %	1,8 %	10,3 %	
		(2012)	(2012)	(2011)	(2011)	(2012)	
Average gross nominal monthly	814 EUR	753 EUR	855 EUR	196,15 EUR	249,62	n.a.	n.a.
earnings by territory (EUR)	(2011)	(2011)	(2011)	(2011)	EUR		
					(2011)		
Gross domestic expenditures	0,83 %	0,58 %	0,63 %	0,14%	0,83%	2,1 %	2,01 % (2010)
on research and development	(2010)	(2010)	(2010)	(2010)	(2010)	(2010)	2,03 % (2011)
(as a percentage of GDP)						2,12 %	
						(2011)	
Number of employees in	3 721 (2010)	4 811	28 128	723 (2010)	116 196	3 246 336	3 644 092 (2009)
		(2010)	(2010)		(2010)	(2009)	
Number of researchers	3 370 (2010)	4 304	24 049	475 (2010)	73 413	2 036 061	2 320 505
		(2010)	(2010)		(2010)	(2009)	(2009)

## Selected key determinants and effects of cross-border clusters for higher competitiveness of cross-border regions



Higher competitiveness of cross-border regions

#### Conclusions and recommendations

- Transcarpathian region is relatively small region of Ukraine and occupies only 2.1% of the total area of the country, most of the land is mountainous and piedmont areas. Considering the nature and geographical location, cultural and historical heritage and natural resources of the land (forests, mountains, mineral and thermal springs, etc.) region is more than a recreational and tourist industry.
- An important factor that affects the socio-economic development of the region is the neighborhood of the 4 EU countries. Location borrows latest technology, investments, ideas, often through joint ventures, which undoubtedly has a positive effect on research and innovation in the region, as most executives are ready for international cooperation and to improve its economic activities by various suitable methods.

 Košice region in Slovakia, it is a sixth region in Slovakia, in the term of GDP, the second most populous region, according to the number of inhabitants.

- Košice self-governing region has a relatively educated and skilled workforce that is a key assumption for development of innovation.
- The supporting of knowledge creation can be found in this region and there is a positive trend in development of the economically active population oriented on knowledge.

- Two cross-border regions Transcarpathia and Kosice Region are mostly similar in geographical, geopolitical, economic and cultural aspect.
- The innovation performance is relatively low.
- Both regions have transit corridors to other countries. They both have also mutual border with more countries. There is one of the most important features of these regions.
- According to an economic aspect the economy of both regions are rather different. In Kosice prevail metallurgy, engineering industry and electrical engineering.
- Kosice region is technically more developed, than Transcarpathia region.
- Transcarpathia region cannot be called industrial, the local economy is mostly expressed by agriculture.

Kosice region seems more ready and this is mainly in the **ICT sector**. Subjects from the ICT sector in the Košice region are often very innovative and it is possible to find a number of equally innovative and creative actors (universities or businesses) in the Transcarpatian region too.

In the food sector, there have been created few interesting innovative solutions in the cross-border region that could serve as base for future developments. Support for R&D and innovation activities in the Košice region is one of the key priorities of the city, region.

- Transcarpathian region is lagging behind in RDI policies, programs and documents as well as in the educational system, which would reflect these trends.
- Both regions have no financial support or financial support is greatly underfunded. On the other hand, although the monitored level of social capital is low, this is often due to lack of relevant information on given area.
- The area of potential cross-border cluster in comparison with average developed regions of the European Union are relatively underdeveloped and also less homogeneous with significant intra-regional differences.

 In order to achieve a better cooperation between subjects (public administrations, universities, businesses, support institutions) in the Eastern Slovakia and the Transcarpatian region, it is important to reassess the effectiveness of current entry regime at the Schengen border that dissuades actors in both sides from the cooperation. This key aspect determining the cross-border cooperation is in hands not of regional neither local public administration.

- It is evident that cross-border potential of Košice an Transcarpathian region is currently not sufficiently used and analysis has revealed many shortcomings that need attention. The most important advice can be summarized in a few key points:
- In primary research, respondents often expressed that they have insufficient information about RDI institutions, about potential partners for cooperation, the sources of funding etc. It is absolutely necessary to increase awareness of the issue.

- Regional RDI policy must involve more cross-border aspect to the strategic development documents as well as in supporting cooperation between key regional players also in interconnection labor market and education system.
- Košice region may inspire Transcparpathina region in the area, some best practice, especially as regards ICT sector.

 Due to lack of financial assistance from the regional level, both key regional players should be more actively involved in international aid, which can contribute significantly to building a better research infrastructure in cross-border aspect.  Applied research of universities and other RDI institutions could be more focused on regional issues, analysis of specific cases of cross-border cooperation and build a database of missing relevant information and knowledge, which could be collectively shared with the aim of developing common projects.  As the Schengen border is not a barrier for the ICT sector, and this sector could be suitable for potentional cluster initiatives, within the local economic development approaches and several examples from practice the sector is also open to start the cooperation.



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Co-funded by the Erasmus+ Programme of the European Union



## **European Higher Education in the World**

An Erasmus+ Capacity Building Project (2017-2020)

#### Case study of reforming Master Programmes in Finance in Armenia and Moldova













ARMENIAN STATE UNIVERSITY OF ECONOMICS












- **1. European Higher Education in the World**
- 2. Key facts about REFINE
- 3. Project consortium
- 4. Project objectives
- 5. Main project activities

# The European higher education in the world strategy



- launched in 2013, aims to promote mobility and cooperation between universities, EU member states and no-EU countries.
- The key objectives include:
- Enhancing the overall quality of European education by facilitating peer learning, cooperation and comparison with other education providers worldwide;
- Boosting innovation and job creation in Europe by attracting internationally mobile students and skilled migrants;
- Broadening horizons, increasing employability and preparing students to become global citizens;
- Influencing and engaging new audiences in a way that advances the EU's position in the world.

# The European higher education in the world strategy



- Higher education is at the heart of the Europe 2020 strategy. HEIs have a key role in ensuring that Europe becomes a smart, sustainable and inclusive economy.
- Europe's higher education institutions have worked and cooperated together for decades. Now they need to start building partnerships beyond the EU's borders so that they continue to attract the most talented students and remain competitive in an increasingly globalised higher education landscape.
- Europe currently hosts 45% of the 4 million students who study outside their home countries each year. They are attracted by world-class curricula, teaching excellence and cultural diversity. But if Europe is to maintain this lead against mounting competition from Asia and Latin America, the Member States and the Commission must work together to create the right conditions for international cooperation to flourish.

## **1. Key facts about REFINE**



- Title: "Reforming Master Programmes in Finance in Armenia and Moldova" (REFINE)
- Duration: 3 years (15 October 2017 14 October 2020)
- Coordination: University of Applied Sciences BFI Vienna (Austria)
- 10 Higher Education Institutions (HEIs), 6 Associated Partners
- Budget: 615.507,00 €

## 2. Project consortium



#### **European Union:**

- 1. University of Applied Sciences BFI Vienna (UAS-BFI, Austria, coordinator)
- 2. Technical University of Kosice (TUKE, Slovakia)
- 3. Amsterdam University of Applied Sciences (AUAS, the Netherlands)
- 4. University Nice Sophia Antipolis (UNS, France)



### **Project consortium**



#### Armenia:

- 5. Armenian State University of Economics (ASUE, Yerevan)
- 6. Russian-Armenian University (RAU, Yerevan)
- 7. Gavar State University (GSU, Gavar)





### **Project consortium**

#### Moldova:

- 8. Academy of Economic Studies of Moldova (AESM, Chisinau)
- 9. Moldova State University (MSU, Chisinau)

10. Comrat State University (KDU, Comrat)







## **Project consortium**



#### **Associated Partners:**

- Armenia:
  - VTB Bank Armenia
  - NASDAQ OMX (stock exchange)
  - AVAG Solutions (financial consultancy)
- Moldova:
  - National Bank of Moldova (central bank)
  - Mobias Bank
  - PwC Moldova (financial consultancy)

# **3. Project objectives**



#### Wider objective:

- To enhance the quality and relevance of 6 existing Master (MA) programmes in Finance in Armenia and Moldova through targeted reforms
- MA programmes:
  - ASUE: "Finance"
  - RAU: "Financial Economics"
  - GSU: "Finance"
  - AESM: "Financial and Banking Administration"
  - MSU: "Financial Management and Business Accounting"
  - KDU: "Corporate Finance"

## **Project objectives**



#### Specific objectives:

- 1. To reform 6 existing MA *curricula* in Finance taking into account the latest international developments in the subject area
- To promote the quality and relevance of the MA programmes through the development of updated and new *course materials*

## **Project objectives**



#### Specific objectives (continued):

- 3. To further develop the competences and skills of *teaching staff* through training courses in innovative teaching methodologies and current topics in Finance
- 4. To increase the alignment of the MA programmes with *labour market requirements*

## **Project objectives**



- → Core dimensions of REFINE:
- Reform of existing MA curricula
- Development of course materials
- Training of teaching staff
- Alignment with labour market requirements



#### **Structure of the project:**

- The REFINE project is structured around 9 "Work Packages" (WP)
- The activities of each WP result in concrete "*deliverables*" that have to be submitted to the EACEA
- Each WP is led by one partner institution
- All other partner institutions contribute to the WP







#### WP1: Review of MA Programmes (TUKE)

- Duration: M1-M6 (10/2017-04/2018)
- Key results: Reform guidelines (1 per programme)
- Event: Workshop in Kosice

#### WP2: Curriculum Reform (UAS-BFI)

- Duration: M7-M12 (04/2018-10/2018)
- Key results: 6 reformed MA curricula
- Events: Working visits to Armenia / Moldova



#### WP3: Course Materials (UNS)

- Duration: M13-M33 (10/2018-07/2020)
- Key results: 48 course packages
- Events: Working visits to the EU partners

#### WP4: Teacher Trainings (AUAS)

- Duration: M13-M22 (10/2018-08/2019)
- Key results: 48 teachers participated
- Events: Trainings in Amsterdam and Nice



#### **WP5: Implementation of MA Programmes (AESM)**

- Duration: M15-M33 (12/2018-10/2020)
- Key results: 1<sup>st</sup> year implemented (150 students)
- Events: Start of programmes in winter term 2019

#### WP6: Quality Assurance (RAU)

- Duration: M1-M36 (10/2017-10/2020)
- Key results: QA manual, QA reports (IAB, QAG)
- Events: Consortium meetings (see WP9)



#### WP7: Dissemination and Exploitation (ASUE)

- Duration: M1-M36 (10/2017-10/2020)
- Key results / events: Website, 4 workshops, 2 conferences, EAIE session submission

#### WP8: Sustainability (MSU)

- Duration: M18-M36 (03/2019-10/2020)
- Key results: Sustainability strategy, follow-up agreements



#### WP9: Project Management (UAS-BFI)

- Duration: M1-M36 (10/2017-10/2020)
- Key results: Interim Report, Final Report
- Events: Annual coordination meetings



### Thank you for your attention!

#### www.reforming-finance.eu



Co-funded by the Erasmus+ Programme of the European Union Hungarian-Slovak cross-border research on the labor market opportunities of disadvantaged job seekers

ANDREA VISZTENVELT – CSILLA JUDIT SUHAJDA Szent István University Hungary

### Purpose

In this research our aim was to highlight the different labour market issues related to the jobseekers with disadvantages, based on an empirical research in the microregion of Balassagyarmat, Salgótarján in Hungary and Losonc, RimavskaSobota in Slovakia.

### Statistics

Microregion	Population (person)	Number of the working age population (person)	Number of the unemployed population (person)	Ratio (%)
Balassagyarmat	39.829	28.700	2208	13,1%
Salgótarján	64.504	50.230	6026	8.3 %
Losonc	72.837	59.203	5861	9.9%
RimavskaSobota	83.124	66.877	14.450	21.6%

### Sample by sector, size



### **Resoults:** attitude



same as other employee

do not want to employ

unemployed Long term population has no motivation to reintegrate to the labour market, it has no adequate knowledge, their skills are often poor. Career starters has no working experience, and their expectations are often irrealistic related to the salary and the career opportunities. Roma population described as demotivated and poorly educated group on the labour market.

### **Resoults: methods**



supporting self employment

reducing bias

wage subsidy

special, complex programmes

obligatory work

education

### **Resoults: effectiveness**

#### Disadvanteged job seekers are less effective work force (person)



### **Resoult: integration**

### The integration of a disadvantaged job seeker is longer



### **Resoult: integration**

#### Integration of them is harder (person)



### Conclusion

The respondents emphasised that the adult education and the different, adequate social projects would help to integrate this population to the labour market. Contraversy to other research, social biases are not discovered, probably because of the common employment projects based on different European Union project's implementation in the border area.

# Suggestions

• We suggest to create more and relevant information basis to reduce biases of the empolyers and to **implement** projects based on different human services (labour counselling, life long learning guidance, supporting labour market information) to support this sensitive target group.

#### Thank you for your kind attention!

#### Email: visztenvelt.andrea@gtk.szie.hu

#### Resilient (?) small towns in Hungary

Vörös-Torma, Katalin, PhD. student, Department of Regional Science Eötvös Loránd University, Budapest

Szabó, Pál, PhD. Department of Regional Science Eötvös Loránd University, Budapest

LOCAL AND COMMUNITY DEVELOPMENT: BUILDING SMART COMMUNITIES 17-18 May 2018. Herl'any, Slovakia

#### Introduction

After transition – new challenges for Hungarian settlements

New constitution of Hungary (1989):

- capital, counties, towns and villages (settlements)
- county, settlement regional, local self-government

Rights of local governments are equal, but the responsibilities of local governments may be vary

(LXV/1990., CLXXXIX./2011. law).

In 2018 in Hungary there are 3155 settlements with local government.

An even distribution of settlements (and populations) in rural areas (plain)



nepesseg.com

The number of towns has increased quickly during and after the transition: in 1980: 95,

In 1990: 166 (some new small towns),

in 2000: 222 (only new small towns),

in 2010: 328 (same),

in 2018: 346 (same)

(application for the status)


Source of data: KSH

A lot of new small towns: 100 towns – inhabitants below 5000 (204: <10.000) New category of settlements in Hungary since 1990

New functions: economic and social center of an area (?) ...

#### Unequal density of towns





### New microregions (government administration)

2013: 175 microregions ("járás") of government administration were created; centers: towns

Spatial dispersion of large towns - unequal. Population of 23 centers of administrative districts: below 5000 inhabitants/town









#### Microregions of the 23 smallest centers in Hungary

- Transdanubia, northeastern part of Hungary (historical reasons)

- best known: Tokaj and Pannonhalma (World Herritage), Záhony, Letenye (border crossing points), Fonyód (tourism-Balaton), Devecser (disaster)

### Town since

1986: **Vasvár, Tokaj** 1989: Záhony, **Tab**, Rétság, Pétervására, **Letenye, Fonyód**, **Csurgó, Csenger** 1993: Pécsvárad, Baktalórántháza 1995: **Sásd** 1997: **Sellye, Devecser**, Bóly 2000: **Szob**, Pannonhalma 2001: **Tét, Gönc** 2004: Cigánd, Bélapátfalva 2005: **Kemecse** 

New towns, and new (?) function – administrative center (!) (60% of them was **center** in the previous time period [till 60s, 70s....])

#### Resilience

- settlements: traditional and new problems, differences in speed
- quick solutions? it depends on the reactivity of the local societies and local governments
- local resilience as the ability of a settlement to anticipate, prepare for, respond to, and recover from a disturbance



Population of 23 small towns in Hungary, 1990-2016 (Source of data: KSH)

Most of the towns: decreasing with 10-15% Fonyód, Vasvár, Rétság – some parts of the towns became independent settlements (in socialism: unification of settlements) Devecser – natural disaster (death, injury, migration)



Number of job seekers in the 23 small towns in Hungary, 2000-2016 (Source of data: KSH) After 2008, effects of economic crisis: increasing in most of towns

After 2013, "public work program": decreasing in most of towns

Sudden rise (plus >100 jobseekers/year): after 2008; Baktalórántháza, Csenger, Tét and Csurgó (local reasons, e.g. Tét: 2009 - cable manufacturing ceased)

#### Challenges:

#### Variable Hungarian legal environment

- for example the new law (CLXXXIX./2011) about Hungary's Local Authorities has changed a lot by other (35) laws between 2011-2017. (These are: CXCVI/2011, CCI/2011, XXXI/2012, XXXVI/2012, LXXXIV/2012, CVI/2012, CXVII/2012, CXLV/2012, CLXVII/2012, CXC/2012, CCCVI/2012, CCXI/2012, XIV/2013, XXXVI/2013, LXXXV/2013, LXXXV/2013, LXXXV/2013, CXXXI/2013, CXXXI/2013, CCIII/2013, CCXVIII/2013, CXXVIII/2013, CXXXI/2014, LXXXV/2014, XCIII/2014, CI/2014, LIV/2016, LXVI/2016, CXVI/2016, CLXXXV/2016, L/2017, CXXXIV/2017.)

- the acceptance of newer and newer changes is difficult for the local governments

New administrative functions (centralization...)

- more functions: from settlements to microregion
- demand: buildings, skilled workforce, infratsructure, ...

#### **Case Study: Tab**

- small town in Somogy county, southern part of Lake Balaton
- Population: 4300 in 2018 (5239 in 1990)
- had a district centre rank till 1972 and got it back in the year of 2013
- town since 1989
- was an agricultural settlement but after the structural transformation it's profile shifted to industrial



### **Challenges for and Local Answers of Tab**

### Challenges

- Population declining because of migraton and aging
- Conversion of agriculture at the era of socialism
- Maintain the contact with the biggest company of the city (Flextronics International)
- Take care of disadvantaged people

#### Answers

- Renovated the District Centre Office to keep the employees
- Made a connecting road to the motorway (M7)
- Developing the cityscape, infrastructure and social care to maintain the workplaces
- Train appropriate specialists

#### Conclusion

- settlements: more and different challenges – but only a few tools

strengthening resilience:

- providing more predictable legal environment by the government
- strengthening local governments (more self-determination)
- enlargement of local incomes of local government (more ceded taxes)

**Thank you for your attention!** 

# HEAD IN THE CLOUDS: Digital Learning to Overcome School Failure Tomáš Želinský, EKF TUKE



# PROJECT PARTNERS



Vienna University of Technology Austria (Coordinator)



GAIA Kosovo



SCIO Czech Republic



Technical University of Košice

Verein Offenes Lernen Verein Offenes Lernen Austria



Fundatia Crestina Diakonia Filiala Sfantu Gheorghe (Romania) Súkromná ZŠ, Galaktická Slovakia

### WHY THIS PROJECT?

- Roma are the largest ethnic minority in Europe (approx. 12 mil.)
- 30% of Roma in Europe are in paid work and 87% live below the poverty line
- Currently Roma children are 5 times less likely to attend school at compulsory school age, 89% of Roma leave school early
- PISA tests: 80-95% of Romani-speaking students have not acquired basic cognitive skills and competencies =>
  - Limited possibilities to find qualified employment
  - Problems to cope with the complex demands of today's societies

# WHY CHILDREN LEAVE SCHOOL?

- Cultural or cognitive differences leading to insufficient understanding of learning materials
- Inappropriate teaching styles, curricula or ways of presenting knowledge by teachers
- Socio-economic reasons
  - Poor infrastructure, lack of available public transport, shortages of equipment, geographical distance to schools
- Individual reasons
  - Language and communication problems, low confidence in schools, early marriage and childbirth, necessity of contributing to household income













# AN ALTERNATIVE TEACHING APPROACH

- Self-Organised Learning Environments (SOLE) developed by Sugata Mitra initially with a "hole in the wall" experiment starting in 1999.
- 2013: opening of the first "School in the Cloud" in England
- After many years of research Sugata Mitra received the TED Prize in 2013, as he has inspired educators around the world with his ideas.



# SELF-ORGANISED LEARNING ENVIRONMENTS

- Engage students in their own learning process
- Experiential learning
- Students concern themselves creatively with their own environment
- A learning process driven by students is
  - Curious, Collaborative, Engaged, self-organized, facilitated by adult encouragement ("grannies")
- Students are encouraged by the educators to find answers to what Mitra calls "big questions" by using the internet
- The learning objectives of an SOLE activity are not predefined

### OUR APPROACH

- Inspired by SOLE approach
- Complete self-organization was not possible
- Teacher/mentor had to be involved (but: minimize their involvement!!)
- Emphasize kids' autonomy!

## IMPLEMENTATION

- 3 different locations
  - Romania: Afternoon care program, about 30 kids (6-11 years old)
  - Kosovo: Community center for kids and teens, about 5-30 kids (10-17 years old)
  - Slovakia: School, about 20 kids (12-14 years old)
- Implementation time: 6-8 weeks per **box** and location
- Materials and boxes are provided
- At the beginning of each box, guidance session for teachers
- Regular skype-sessions throughout the implementation
- Regular progress evaluation

# THE BOXES: STRUCTURE

- Easily implemented
- Group and individual settings
- Teacher-manual
- Task sheets
- Very simple
- Modular structure
- As little text as possible
- Online hand-in tool
- Evaluation
- 6 topics



# DESCRIPTION OF BOXES

### BOX 1: VIDEO

- Handle a mobile device, tablet, smartphone
- Work with QR-codes, online apps
- Search for information on the Internet
- Make a video / short film (storybook writing, taking and editing of pictures, interviews...)
- Give and receive feedback



Record a video about famous person you admire!



Some celebrities you may know have become famous only thanks to their homemade YouTube videos.

Do you want to be a YouTuber?

- Do you know any famous YouTuber?
- Record a short video (at most 3 minutes!) about famous person you admire (favourite singer / group or actor / actress / ...).



Once you are finished, upload the video to our portal.



1e1

Be a professional movie reviewer!

Prepare the final version of your video!



For more than a month, you and your classmates have been working on your own videos. Now, you have plenty of recorded material.

- Think of a way how you would like to present your short movies (e.g. combining) different parts of different videos) - prepare a simple screenplay, take a photo of it and upload it to our portal.
- Follow your screenplay and create the final version of your video (cut & paste, add) music, add effects...)



### BOX 2: IT

- How to assemble a Raspberry Pi computer
- Use (Open) Office Programs (text processing, email clients)
- Online services (Google, Google Maps, Wikipedia, YouTube)
- Elementary level computer programing skills using Scratch



### 1) Some more Scratch - programming:











### 2) Try:



Try out the other costumes and show us what you found out by sending a screenshot

### BOX 3: ENGLISH

- Basics of English (vocabulary, building sentences, spelling, pronunciation, tongue twisters, family trees, describe a friend, recording audio messages etc.)
- Communicate with other participating students
- Retrieve information online (e.g. how many people speak English and in which countries?)



3: English

3b4

Tongue twisters
If a dog chews shoes, whose shoes does he choose?



 Listen to the tongue twister https://soundcloud.com/user-266082158/dog-chews and read it aloud.

It looks like this written:

"If a dog chews shoes, whose shoes does he choose?"

- Repeat the tongue twister really fast and make a video of it.
- Upload the Video



The second

2	3: English	Talk to internationals	
1.	-		-1940 (Sec.)
STV	3f7	Welcome to my school	170 X
			IIp-app.eu/WWWWW

Half of your class will now act to be children from another country that visit your school. The other half has to host them.

You are going to welcome them – one person always welcomes and leads one of the friends acting to be from another school.

Do not forget! - Your visitors don't speak your language. You have to speak in English.

- Welcome her/him to class and introduce also your friends.
- Do a tour of the school. Show them the places you highlighted on the map. The one acting as a visitor can ask questions – always in English!
- Record the video about your "school tour".
- Upload the video.

## BOX 4: PROGRAMMING

- Hands-on programming and engineering activities using different tools and software
  - Makey Makey boards
  - Scratch
  - Ozobot robots
  - Lego WeDo
  - Minecraft



Topic: Minecraft

Welcome to Minecraft - controls



goo.gl/Qs8oQN



To start Minecraft:



Controls:

KEY	ACTION
ESC	Game Menu / close Inventory
TAB	Letgo of the Mouse

111	Box: Programming	Topic: Lego WeDo - Introduction	
	Task 4d1.1	It's hot – let's build a fan !	
			lip-app.eu/6KJ6



- 3) Start Scratch on Raspberry PI (see IT-box)
- 4) Scratch




Where would your Ozobot like to travel to? To London? To Paris? Maybe to the USA, as in the picture?

Draw a map of your neighbourhood, your city, your country or of Europe and send your Ozobot on a long, long journey ...



111	Box: Program		
	Task 4a		

ming	Topic: MakeyMakey	
.4:	Basics - Through the eyes of the computer	

Look at the picture - it shows what the computer "thinks" when the electric circuit is closed and runs through the "arrow-up" key:



- the MakeyMakey is connected to the computer via USB-cable
- 2 alligator-cables are connected to the MakeyMakey: one to "Earth" and one to

# HOW IT WORKS

- WeDo Lego: <a href="https://www.youtube.com/watch?v=AlSUWKZprrc">https://www.youtube.com/watch?v=AlSUWKZprrc</a>
- Ozobot: <u>https://www.youtube.com/watch?v=KX1wuSiwViA</u>
- Makey Makey: <u>https://www.youtube.com/watch?v=kkZV8Xx3Qg0</u>

# BOX 5: EKOPOLIS

- Educational board game addressing environmental issues in a playful manner
- Pollution, environment, sustainability, waste reduction, recycling, ecological footprint
- Raise awareness for the impact of human actions and stimulates discussions
- Get to know their hometowns (e.g. draw a map etc.)





5

Please insert translation here

Live in a sustainable way! Please insert translation here



**SUSTAINABILITY** 

# BOX 6: THE REAL WORLD

- How to repair things
- Going on a trip
- Personal hygiene (bacteria and viruses, doctors, physical activity, vitamins, water drinking, drugs, first aid basics)
- Relationships (different levels of relationship, friendly and unfriendly behavior, bullying)
- Roma culture (history, traditions, role models, language...)



Going on a trip Going to the restaurant – Have you ever gone to the restaurant?



• Watch this video:

6: Real Life

6e11.1

https://www.youtube.com/watch?v=bROOWTpyTlg

- Which mistakes did Peter (and the child waiter) do while ordering and serving food?
- Play a scene in which you will show how it should look like/should not look like.
- Upload a video.

**Hints**: you can search on the Internet for more information, just type: "how to behave..." on YouTube or Google and you will find many videos related to this topic. For those who want to find out more about etiquette in a funny way, watch this video (in English): <u>https://www.youtube.com/watch?v=bROOWTpyTla</u>



# EXPERIENCES

- Sole-Concept and idea can be not implemented 1:1is not practicable 1:1 for conveying knowledge
- Although the box content is identical very different ways of implementing the boxes in different locations
- Tasks sheets with "hands-on" tasks work best at which all senses are demanded work best
- Visible improvements so far:
  - Social Interaction
  - Writing and reading skills
  - Handling of devices such as computers and tablets

## PERSONAL EXPERIENCES/FEELINGS

...Thanks to this programme, I have a feeling that they've started to integrate with the other children... Sometimes it is difficult, sometimes joyful, sometimes there is anger. But this programme can be implemented only with heart and soul, and I love to do this...

Noémi Dénes, Romania

....For them it was really mind-changing... because I see the change in their life.... And I like really much what I'm seeing...

Szidónia Dulányi, Romania

# PERSONAL EXPERIENCES/FEELINGS

...The children learn, but they don't perceive it as learning. And that's the main point... When a student who had no will to learn at all, was skipping classes, couldn't stand the school, stays at school in the afternoon, and you see that he gets interested and creates something, and then comes to me and says "This is great", that is what is important to me, that is just perfect...

Veronika Bystrianska, Slovakia

...This is positive, because the kids have an afternoon activity, when they can do things they cannot do at home...

Marcel Šenkýr, Slovakia

# PERSONAL EXPERIENCES/FEELINGS

...and the parents are happy... they're excited... My future belief is that these schools can exist everywhere, and we should leave the kids learn by themselves. They know how to do it.

Lulyim Bucolli, Kosovo

...I think that Head in the Clouds provides an opportunity for the kids who live in Gracanica, but also for their teachers and anybody else involved in their education and their everyday life.

Slobodan Vasić, Kosovo

























## THANK YOU FOR YOUR ATTENTION!

https://www.youtube.com/watch?v=0w2rpd5BnFU&t=184s

## NOW:

## Your turn to practice!



## TO CLINK OR NOT TO CLINK?





## TO CLINK OR NOT TO CLINK?



On the Transmission of Community Norms: The Case of Segregated Roma

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17 May 2018

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Desigr

Setting

Results

### Social Norms

- 'Grammar of social interactions' (Bicchieri, 2006). Unwritten societal rules that prescribe (or proscribe) how people should (or should not) behave in a society or group.
- Well established in philosophical, anthropological, sociological, and psychological literature.

On the Transmission of Community Norms: The Case of Segregated Roma

#### Introduction

Design

Setting

Results

On the Transmission of Community Norms: The Case of Segregated Roma

#### Introduction

Design

Setting

Results

Conclusion

Social Norms

Economics

- Social norms are usually thought of as interpretations for outcomes or behaviours otherwise difficult to explain.
- Difficult to measure and predict influence of social norms on behavior.
  - Krupka and Weber (2013) introduce a novel methodology to elicit social norms, based on a simple incentivized coordination game experiment.
  - Multiple equilibria in coordination games: the experiment does not necessarily have to measure the (true) social norms.

### Social Norms

Economics: What does the experimental approach elicit?

- Lapinski and Rimal (2005, 2015) caution against aggregating individual-level perceived norms as the operationalization of collective norms.
- Their argument: Individuals' perceptions often diverge significantly from collective norms.
- An aggregation of *individuals' behaviours*, however, can serve as a proxy for collective norms.

On the Transmission of Community Norms: The Case of Segregated Roma

#### Introduction

#### Design

Setting

Results

### Transmission of Social Norms

Three types of transmission (Boyd and Richerson, 1985):

- Vertical = intergenerational (Bisin and Verdier, 2011; Dohmen et al., 2012),
  - Bidirectional relationship (Bell, 1968).
- Horizontal = from peers such as friends or classmates (Brooks-Gunn et al., 1993; Gibson et al., 2009; Miltenburg, 2015),
- Oblique = from other adults the children have contact with, such as adult non-familial community members, teachers and other authorities (Grusec, 2002).
  - Direct (direct contact),
  - Indirect (indirect contact: such as role models, media...).

On the								
Transmission of								
Community								
Norms: The Case								
of Segregated								
Roma								

Introduction

Design

Setting

Results

### Transmission of Social Norms

Which influence is stronger? That of parents or that of peers?

- Ambiguity in literature on the socialization of children.
  - Emphasis on the importance of the role of parents (Maccoby, 1992)
  - Stressing the role of peers (Harris, 1995).
- The relationship is far more complex (Collins and Maccoby, 2002).
- Stronger effects of peers in some issues, higher importance of parents in other domains (Devereux, 1970).
- Why important? We need to understand how norms are transmitted, IF there is a need to influence them.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

### Our Research & Question

Previous studies based on interviewing parents (also about what they think they children would respond) (Eisenberg and Valiente, 2002), involving numerous issues (Grusec, 2002).

#### Our approach

Experimental approach to the investigation of the role of parents and peers in the transmission of community norms.

#### Our contribution

- Contribution to literature on the transmission of social preferences.
- First to examine the transmission of social norms across generations with an incentivised experiment.
- Extending the existing (both economics and psychology) studies investigating the differences in the role of parents and community in development of preferences in children.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Desigr

Setting

Results

### Our Research & Question

What we elicit?

- In Lapinski and Rimal (2005, 2015) fashion: perceived community norms
- How do we elicit?
  - A simple coordination game proposed by Krupka and Weber (2013).

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Desigr

Setting

Results

## Our Research & Question

Related experimental literature

- Capriani et al. (2013): first experimental study (economics)
  - Children and parents; standard public goods game.
  - Subjects of Hispanic and African American ethnicity from a 6th grade of public school in Washington, DC.
  - Findings: no correlation between the degree of cooperation of children and their parents.
- Ben-Ner et al. (2017):
  - Children and parents; Dictator game
  - Subjects: 3-5-year-old children and their parents, mostly of African-American and Hispanic ethnicity, from a predominately low-income area in Chicago
  - Findings: little association between the giving of parents and their preschool-age children in dictator games, most specifications reported showed no significant correlation.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

- 826 participants (402 children, 424 parents, from 257 families)
  - 15 villages in Eastern Slovakia
  - Experiments took place in schools/community centres
  - 4 subjects per room (2 rooms: children and parents separated)
  - Multiple sessions per village
  - ▶ 5 (2.50) EUR for guessing a correct response.
- Perceptions of 10 community norms.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

## The design

- Following the approach by Krupka and Weber (2013) we elicit beliefs about community norms using a simple coordination game:
  - "For ...(something)..., you think other people in settlement believe it is: Very incorrect - somewhat incorrect - somewhat correct - very correct"
  - "… If you guess, how the most of other people from settlement would respond, you will receive 5 (2.50) EUR."
  - We asked about beliefs such as: gender stereotypes, work behaviour, school attitudes...
- One vignette chosen at random to determine payoffs.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

## The design

#### Task

#### Perceptions of community norms:

- 1. for a woman to be a leader
- 2. for a couple/partners to have more than 4 kids
- 3. for a man to be unemployed
- 4. for a woman to earn more than a man
- 5. for a man to work as a nurse
- 6. for a man to work as a home maker
- 7. for children to skip school
- 8. for everyone to graduate from high school
- 9. for people who graduate from high should stay inside the settlement
- for children to be separated in classrooms according to their nationality (ethnicity)

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

## Setting

- Our experiment took place in the context of marginalised Roma communities in Slovakia. Largest minority in Europe
- < 30% of Roma in Europe are in paid work and 87% live below the poverty line, according to the European Union Agency for Fundamental Human Rights (2011).
- Currently Roma children are 5 times less likely to attend school at compulsory school age
- The majority of Roma remain in their municipality of origin (UNDP,2012)

#### In Slovakia and Eastern Europe

- Less than 50% of Roma households have direct access to water.
- 20% never finish a single grade of primary
- ▶ 10% obtained higher than primary education.
- For the Slovakian population- net enrolment rate for primary school was 92 percent, and the survival rate to the last grade of primary school 95 percent.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

- In EU member states in nearly all countries at least 50% hold a negative view towards Roma.
- Around 40% of Slovak children consider Roma children as inferior. 60% reported an objection when asked to share the same desk as a Roma child.

#### In Eastern Europe:

 Chronically disproportionate enrolment at special schools for mentally handicapped children On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

### Experiment Village



On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

### Results

- 1 Measure of agreement on social norms beliefs: van Eijk's (2001) measure of agreement A (used to describe agreement, consensus, or polarization among respondents);  $A \in [-1, 1]$ ,
  - ► A = 1: perfect unimodality (=agreement);
  - A = 0: perfect uniformity;
  - A = -1: perfect bimodality (=lack of agreement)
- 2 Clustering of community norms beliefs within families and communities.
- 3 Differences in coordination: parents vs. community
  - 3.1 Do children coordinate more with parents or peers?
  - 3.2 Possible channels: age and school environment

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Desigr

Setting

Results

## [1] Results

#### van Eijk's A

SN: For children to be separated in classrooms according to their nationality [black=parents; red=children]



On the Transmission of Community Norms: The Case of Segregated Roma



woman as a leader; 2. a couple has more than 4 kids; 3. a man is unemployed; 4. a woman earns
more than a man; 5. a man works as a nurse; 6. a man works as a home maker; 7. children skip school;
8. everyone graduates from high school; 9. people who graduate from high should stay inside the
settlement; 10. children to be separated in classrooms according to their ethnicity

#### On the [2] Preliminary Results Transmission of Community Coordination rates at community level Norms: The Case of Segregated Roma 0.1 Parents - strict Parents - weak 0.9 Children - strict П Children - weak Proportion .6 0.7 0.8 Results Н 0.6 0.5 4.0 1 2 3 4 5 6 7 8 9 10 Social norm

 woman as a leader; 2. a couple has more than 4 kids; 3. a man is unemployed; 4. a woman earns more than a man; 5. a man works as a nurse; 6. a man works as a home maker; 7. children skip school; 8. everyone graduates from high school; 9. people who graduate from high should stay inside the settlement; 10. children to be separated in classrooms according to their ethnicity

## [3] Preliminary Results

Do children coordinate more with parents or peers?

On the Transmission of Community Norms: The Case of Segregated Roma

Dependent: $1 = \text{very/somewhat appropriate}; 0 = \text{very/somewhat inappropriate}$									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		
Parents	$0.146^{**}$			0.163***	0.155***	0.159**	0.152***		
	(0.062)			(0.063)	(0.060)	(0.062)	(0.058)		
Peers		$0.543^{***}$		$0.556^{***}$		0.553***			
		(0.078)		(0.079)		(0.090)			
Other adults			0.006		-0.014		-0.009		
			(0.109)		(0.115)		(0.112)		
Diff. in coef.				$-0.393^{***}$	0.170	$-0.393^{***}$	0.160		
				(0.100)	(0.143)	(0.109)	(0.140)		
Village	YES	YES	YES	YES	YES	YES	YES		
SN	YES	YES	YES	YES	YES	YES	YES		
Children ch.	NO	NO	NO	YES	YES	YES	YES		
Parents+HH ch	NO	NO	NO	NO	NO	YES	YES		
Ν	5,358	5,647	$5,\!647$	5,318	5,318	5,102	5,102		

Table 1: Regression output: Coordination with parents and peers

Notes: Binary Probit coefficients, clustered standard errors in parentheses. \*\*\* denotes P < 0.01, \*\* P < 0.05 and \* P < 0.1. Wald Test used for testing the differences between coefficients. In models we control for village, social norm vignette, children controls (age and gender), and parents and household controls (age, gender, highest attained education of parent, parent's employment status, number of children in the household, and household income).
## [3] Preliminary Results Possible Channels: Age and School Environment

On the Transmission of Community Norms: The Case of Segregated Roma

21/22

	Dependent: $1 =$ children have the same norm as their parents (weak def.); $0 =$ otherwise							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	0.005	0.012	0.281***	0.329***	0.004	0.011	0.303***	0.355***
	(0.013)	(0.014)	(0.092)	(0.092)	(0.014)	(0.015)	(0.088)	(0.072)
$Age^2$			$-0.011^{***}$	$-0.012^{***}$			$-0.012^{***}$	$-0.013^{***}$
			(0.004)	(0.003)			(0.003)	(0.003)
HW=YES					0.082	$0.086^{*}$	0.071	$0.071^{*}$
					(0.061)	(0.044)	(0.062)	(0.043)
2-line test: a			$0.017^{***}$	0.037***			0.016***	0.02***
			(2.633)	(3.846)			(2.586)	(2.992)
2-line test: b			$-0.013^{**}$	-0.007			$-0.015^{**}$	-0.01
			(-1.961)	(-1.355)			(-2.224)	(-1.409)
Break point			13	12			13	13
Village	YES	YES	YES	YES	YES	YES	YES	YES
SN	YES	YES	YES	YES	YES	YES	YES	YES
Children ch.	NO	YES	NO	YES	NO	YES	NO	YES
Parents+HH ch	NO	YES	NO	YES	NO	YES	NO	YES
Ν	5,700	5,190	5,700	5,190	5,650	5,150	$5,\!650$	5,150

Table 2: Regression output: Age and School Environment as Possible Channels

Notes: Binary Probit coefficients, clustered standard errors in parentheses. \*\*\* denotes P < 0.01, \*\* P < 0.05 and \* P < 0.1. Wald Test used for testing the differences between coefficients. In models we control for village, social norm vignette, children controls (age and gender), and parents and household controls (age, gender, highest attained education of parent, parent's employment status, number of children in the household, and household income). In rows "2-line test: a" and "2-line test: b" test of Ushaped relationship between the age and the dependent variable is performed using the approach proposed by Simonsohn (2017): Regressions for two separate lines, one for 'low' and one for 'high' values of x while setting a break-point using the Robin Hood algorithm. A U-shape curve is present if the two slopes are of opposite signs and, at the same time, are individually statistically significant (corresponding z test statistics in parentheses).

## Conclusions

- Roma, the largest ethnic minority in Europe, are under-represented in academic literature, not much is known about behaviour of those who are segregated.
- Culture of poverty and intergenerationally reproduced poverty and deprivation.
- Between 2000 and 2013 the EU spent 7.7 billion EUR on Roma inclusion and anti poverty programs.
- However, governmental anti-poverty tools are not effective, and often substituted by non-governmental sector (they have a closer contact with Roma).
- We show that:
  - Children's community norms are more strongly correlated with their peers' norms than those of parents.
  - As children approach the age of 13, the likelihood of having the same norms as their parents increases.
  - School environment seems to be important as well.
  - Policy implications: Age + school environment => important, IF we want to influence norms.

On the Transmission of Community Norms: The Case of Segregated Roma

Introduction

Design

Setting

Results

Conclusion

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