

RESULT COMMUNICATION AND MARKETING PUBLICATION

SUSTAINABLE, INTELLIGENT AND INCLUSIVE REGIONAL AND CITY MODELS



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CONSORTIUM PARTNERS:

Corvinus University of Budapest (BCE)

University of Pannonia (PE)

University of Pécs (PTE)



DEAR READER!

For nearly 3.5 years, within the framework of the project „EFOP-3.6.2-162017-00017 Sustainable, Intelligent and Inclusive Regional and City Models”, a consortium was formed by the University of Pannonia – University of Pécs – Corvinus University of Budapest. The consortium carried out research, innovation and networking activities in the field of regional economic growth and in the field of Lake Balaton and cultural heritage and social innovation.

The 3 main strategic fields of the project were based on the joint, complementary research of the consortium.

I am sure that both researchers and management members learned a lot during the implementation of the project; for example, how we can develop, how we can influence the economy and society, how to build local and international professional networks, how to cooperate and move beyond the usual forms.

During the implementation of the project, the universities involved students and young people in the research, thus preparing them for participation in international research programs. Those involved could participate in training sessions supporting the internationalization of higher education. We have renewed and expanded our international cooperation networks, presented research results and models in many forums and worked



with nearly 30 international guest researchers. The activity of the consortium of the University of Pannonia – University of Pécs – Corvinus University of Budapest can be best summarized with the following Henry Ford quote.

*„Coming together is the beginning,
Keeping together is progress,
Working together is success.”*

The consortium collaboration met the expected results, but we are most proud to have been able to establish a network of domestic and international thematic research collaborations as planned by the sponsor of the project and as we had envisioned it!

*Dr. Beáta Fehérvölgyi
dean
University of Pannonia
Faculty of Business
and Economics*



GENERAL DESCRIPTION OF THE PROJECT

With the University of Pannonia taking the lead, the Corvinus University of Budapest and the University of Pécs implemented a joint consortium tender project from 01.07.2017 to 31.01.2021 within the framework of the Human Resources Development Operational Program, thanks to the 1.208.648.902 HUF support provided by the European Union and Hungary.

By implementing the Project, the Members are aiming to play an active role in the field of regional and economic sciences in building a knowledge-based economy and cooperating with actors from international research and development programs. The goal is to increase potential of the participating institutions in the field of Research and Development during the thematically implemented research project, the long-term results of which will be reflected in the acceleration of the development of the knowledge-based economy.

The main professional pillars of the Project were carried forward during the development period into three main research directions, each led by a partner of the consortium.

Within the framework of the Project, talented students and doctoral students in their field of science, who were assisting in scientific work in a student scholarship, also received attention in the basic research. To encourage getting new contacts and networking,

several professional and research groups were set up involving foreign researchers and various professional programs were held to exchange experience and to present the results. For professional and individual development, several training sessions were held, with main focus on the development of international tender management and presentation skills. Owing to the professional activities, the work of multidisciplinary professional communities has significantly contributed to the development of a knowledge-based economy in Transdanubia.

The reasons for our common success were professional dedication, active participation and precision. We are proudly looking back on this 3.5 year-long period and we are also proud to present the results of the Projects in this publication.

Main direction I.:

Identifying the factors defining regional success and competitiveness, creating models (PTE)

Main direction II.:

Social and environmental sustainability model within natural and cultural heritage management (PE)

Main direction III.:

Social Innovation (BCE)



FIELDS OF RESEARCH IN THE PROJECT

Main direction	Sub-project	Research leader
I. Identifying the factors defining regional success and competitiveness, creating models	I.1. Regional innovation systems	University of Pécs
	I.2. Regional research of companies: Regional corporate ecosystem and corporate competitiveness of city-regions in Hungary	University of Pécs
	I.3. Researching the regional economic effects of University of Pécs	University of Pécs
	I.4. Researching corporate innovation and capacity of companies in the Pécs region	University of Pécs
	I.5. Further development of GMR-type model of Hungary and conducting alternative development policy impact analyzes in the Pécs region	University of Pécs
	I.6. Relationship between universities and innovative organizations, the impact of the universities on innovation, university rankings based on the presence of innovation	University of Pannonia
II. Social and environmental sustainability model with natural heritage management	II.1. Tourism mobility around the Lake Balaton – mapping the characteristics of visitors/tourists	University of Pannonia
	II.2. Aspects of the quality of life by the Lake Balaton as a living space	Pannon Egyetem
	II.3. Regulating the heritage protection, operational methods of heritage management – international research	University of Pécs
	II.4. Exploring the touristic institutional system with an outlook to international systems	University of Pécs
	II.5. Exploring and developing opportunities of local values in Veszprém county and the Balaton region	University of Pécs
	II.6. Innovation power, supply and demand of local products in the South Transdanubian Region, and their utilization in tourism	University of Pécs
	II.7. Trademark system of local products with a national and international comparison	University of Pécs
	II.8. Knowledge-based networking technologies among wine and gastro SMEs in Balaton region	University of Pannonia
III. Social Innovation	III.1. Mortality modelling: stochastic methods and computer solutions	Corvinus University of Budapest
	III.2. Regional analysis of the characteristics of prosperity, the expectations of young employees against the future workplace	Corvinus University of Budapest
	III.3. Mobility in the labour market, social innovations to increase the prosperity in the labour market	Corvinus University of Budapest
	III.4. The impact of demographic changes on rural employment, comparing to the international trends	Corvinus University of Budapest
	III.5. Social innovation network through generations	University of Pannonia
	III.6. Monitoring the environmental and social responsibility among touristic service providers	University of Pécs

PROFESSIONAL RESULTS OF THE UNIVERSITY OF PANNONIA

To promote networking between the participating universities, the University of Pannonia has taken on a role in all three main directions. The main focus of the research related to the identification of the factors determining regional success and competitiveness (Main direction I.) is the relationship between universities and innovative organizations, the impact of the universities on innovation. In the case of activities focusing on demographic processes (Main direction III.), a cross-generational social innovation network was mapped within the framework of a separate sub-project. The main element of the professional activities implemented by the University of Pannonia is the "Social and environmental sustainability model within natural and cultural heritage management (Main direction II.).

and its environment, sharing the knowledge between the participants of the market) reflect the results of reflective research to support future developments and the identification of strategic directions.

University students were able to participate in the project and the newly established knowledge can be read in dissertations, scientific papers, as well in prestigious and international publications. In addition, foreign researchers and lecturers came to Veszprém multiple times to gain information in topics such as food waste, cultural tourism management, rural development.

1.6 THE RELATIONSHIP BETWEEN UNIVERSITIES AND INNOVATIVE ORGANIZATIONS, THE IMPACT OF UNIVERSITIES ON INNOVATION, UNIVERSITY RANKING ACCORDING TO THE PRESENCE OF INNOVATION.

Thanks to the location and area of attraction of the institution it has an active role in the region, including one of the most popular touristic destinations, Lake Balaton. Between 2017 and 2019 a number of research projects of international interest were executed under the Sustainable, Smart and Inclusive Regional and Urban Models project. During the extensive data surveys, we asked the residents of the area and also the tourists who were visiting Lake Balaton. Tendencies in this area (aging society, emigration of the population, appreciation of time spent outdoors) and topics in domestic and international discourse (increasing demand for weekend / holiday properties, measurement and detailed knowledge of tourists, role of local products, cooperation between the University

In accordance with the pillar of Horizon 2020, which calls for the dissemination of the excellence and the broadening of the participation, the main goal of the sub-project is to examine the impact of the universities. The mapping of the relationship between universities and innovative organizations is based on the development of databases and the analysis of the information contained in them, in addition to the processing of the theoretical framework on the topic. The results of the research executed along the quantitative methodology, supported by mathematical and statistical calculations are not only of interest to the international and domestic academic spheres, but their practical implications support the effective cooperation between the universities and their environment.



II.1. EXPLORING THE CHARACTERISTICS OF THE TOURISTS WHO VISIT LAKE BALATON

Understanding the characteristics of tourists is essential for the sustainable future of the region. Research at the University of Pannonia provides information to fill this gap.

Understanding the characteristics of tourists is essential for the sustainable future of the region. Research at the University of Pannonia provides information to fill this gap. As a result of the diverse mapping of trips to Lake Balaton, it can be said that the travel decision is mainly based by the recommendation of relatives and friends, previous personal experience and a favorable offer of lodging. The Lake and its surroundings await the travelers year after year, which offers in many cases new

experiences for guests who travel there. Touristic trends such as for example shorter stays or more and more activities are having an impact here as well. Each segment is dominated by families and groups of friends, and most of them still drive their own cars. In addition to tourism actors, the research draws attention to the responsibility of local decision-makers because for most travelers, a tidy, beautiful urban environment is an integral part of the travel experience.



II.2. QUALITY ASPECTS OF LAKE BALATON AS A LIVING SPACE

In recent times, Lake Balaton and its surrounding area became more valuable as a place to live and in addition to emigration, immigration was also noticeable. This rural environment can provide an alternative lifestyle for those coming from urban and metropolitan environments and for those who chose this area as their second or permanent residence.

Research at the University of Pannonia focuses on the local population. It is really important for rural regions these days to provide an attractive living space for the local population and to support the quality of life of those who live there. The result of the research highlights the strong attachment of the people living in the area, and they also map the strengths of the settlements and the areas to be developed.

II.5. EXPLORING AND DEVELOPING OPPORTUNITIES OF LOCAL VALUES IN VESZPRÉM COUNTY AND THE BALATON REGION

In the last couple of years, the exploration of local values has accelerated. The area, which is the catchment area of the University of Pannonia including Lake Balaton, is also significant from the point of view of tourism and the utilization of the local values that can be explored here will greatly contribute to the sustainable future. The main direction of the research is provided by research camps with the active participation of lecturers, researchers and students, in which participants stay in the target area for a few days, following a preparatory process, following a well-developed methodology, while mapping local values and their potentials. The results of the research can form the basis for future developments.

II.8. EXPLORING THE APPLICATION OF KNOWLEDGE-BASED NETWORKING TOOLS IN THE BALATON REGION

The knowledge based networking (social media) tools used by businesses are important in both international and domestic discourse today. The focus of the research is on the Lake Balaton region, including wine and gastronomic enterprises. Wine and gastronomy have undergone a significant transformation in the last few years, they are important actors of and contributors to the local economy and society, offering high quality services. Within the framework of the sub-project, several international good practices were identified and the domestic situation was revealed by a primary data collection listing complex, qualitative and quantitative methods.

III.5. CROSS-GENERATIONAL INNOVATION NETWORK

The livability and economic potential of a region is largely determined by the quality of human capital, which is primarily influenced by the knowledge, competencies and creativity of those involved. The lack or low level of social innovation highlights the need for new forms of interaction that create the basis for making an area livable, increasing the retention capacity of the workforce and population, with a particular focus on new ideas and creativity among stakeholders. The research aims at the assessment of social innovation between generations and different social groups in the catchment area of Veszprém, a university town. Its main objective is to set up a social innovation model, to define indicators for this, and to measure social innovation in the area of Veszprém as a university town.

SUMMARY TABLE OF OUR PROFESSIONAL RESULTS

Number	Indicator, name of quantifiable results	Unit	University of Pannonia	
			Goal	Fact
L_1	Number of participants in programs supporting the supply of researchers	Persons	26	37
SZE_1	Number of new participants involved in researcher support programs	Persons	20	30
SZE_2	Young researchers contributing to the project	Persons	9	17
SZE_3	Young researchers in the project who receive formal „level step“ or international award	Persons	3	5
SZE_4	Number of the supported domestic and international scientific conference presentations	Number	33	42
SZE_5	Number of newly established or new research cooperation content higher education institution, research site collaborations	Number	5	5
SZE_6	Number of higher education visiting researchers from EU/EEA Member States and the Carpathian Basin	Persons	14	15
SZE_7	Number of the potential Horizon 2020 collaborations achieved during the project	Number	7	13
SZE_8	Number of the participants in trainings a trainings for R+D+I purposes and content, research skills development	Persons	45	76
SZE_9	Number of publications created within/as a result of the project	Number		49
SZE_10	Number of foreign language articles created/result of the project	Number		20



PROFESSIONAL RESULTS OF CORVINUS UNIVERSITY OF BUDAPEST

The Main direction of „Social Innovation” was implemented under the leadership of the Corvinus University of Budapest. This research area, which detects economic and social challenges related to the labor market of the future and seeks possible innovative solutions, has been developed by our research network following a multidisciplinary methodology.

First we analyzed the demographic processes that clearly determine the supply side of the domestic labor market and then we presented the labor market effects of the generation issues that are expected to arise in the future and the solutions to be followed. We reviewed the expected effects of the fourth industrial revolution and migration processes on the Hungarian labor market. In addition to direct economic impact assessments, we also examined the new types of flexible forms of work and the new types of needs of the younger generation that will be an essential part of the „workplace of the future”. The result of the project clearly highlighted the need for both workers and employers to start preparing for new types of challenges without delay and for regulation to be constantly adapted to new labor market trends.

1. FORECASTING DEMOGRAPHIC TRENDS AND EXPECTED LABOR MARKET EFFECTS

For developing a local economic development model it is essential to get an idea of the expected demographic trends at the regional level as well. In the project we modeled the development of the age and mortality of the population. The situation of demographics clearly affects local competitiveness. The latest methodological elements will be incorporated into the model of

demographic projections, in particular the analysis of mortality with stochastic methods and computer algorithms. The research of the sub-project related to the pension system and pension awareness dealt with the Hungarian processes, however, the mortality analyses extended to several countries of Europe.

2. EXPECTED IMPACT OF POPULATION AGING ON RURAL EMPLOYMENT, THE ROLE OF SOCIAL INNOVATIONS IN THE EMPLOYMENT OF OLD-AGE WORKERS

One of the defining fields of social innovations is the local labor market. Within that, it is particularly important to analyze the age distribution of the employees and to assess the special situation of employees belonging to different age groups. Population aging poses a number of social problems.

The expected deterioration in the old age dependency ratio (an increasing number of elderly people are inactive among an economically active population) could lead to a decline in the disposable income available to the older age group. However, we expect an increase in the proportion of older workers over 60 and 65 respectively. The main force of economic life is continuous innovation, which has so far been fundamentally linked to the activities of young people. In our research we have found that due to the rapidly expanding technical possibilities, even the older working group has the opportunity for development.

An important point of the research is whether this catching-up can be realized in mass and to what extent it can support the innovative capacity of a declining proportion of young workers. The results of our research can help to achieve future employment in old age more effectively and contribute to increasing the employment rate.



3. LABOR MARKET MOBILITY, SOCIAL INNOVATIONS TO INCREASE LABOR MARKET WELFARE

The role of well-being at work is becoming increasingly important in developed market economies. We analyzed the welfare characteristics of workplaces and examined the extent to which an environment that ensures the well-being of the employee can promote the growth of innovation potential. We conducted interviews with company executives to assess what trends they can see from the employer's side and with what competencies employees will be in demand in the future. We also analyzed the causes of employment migration and its social and economic effects.

4. REGIONAL ANALYSIS OF WELFARE CHARACTERISTICS, EXPECTATIONS OF YOUNG WORKERS REGARDING THE WORKPLACE OF THE FUTURE

The millennium is playing an increasingly important role in the labor market and this generation has novel expectations of employers. Because of this, we examined the labor market attitudes of the young age group in the framework of a questionnaire survey, in particular to the development of the demand for new and unconventional forms of work. As a result of the development of digitization, the so-called Digital Nomad, a place-independent form of employment. We analyzed the international experience of the phenomenon, examined its role in urban and regional development, in retaining a skilled young workforce. One of the defining dimensions of regional prosperity is the balance of work and leisure, the quality of leisure time. Therefore our tourism-focused research element undertook to present a number of innovative solutions based on regional resources that increase well-being, especially with regard to the possibilities of involving older people in the sector of tourism.

During the research process, we organized three international conferences and workshops.

2018: „*Innovation, Integration and Mobility*” conference,

2019: „*From Digital Nomads to Remote Companies*” workshop,

2020: „*Living Longer, Working Smarter, Aging Well*” conference.

In connection with the organized events, in the coordination of the project we carried out intensive publishing activities, edited journal issues and published a book.

- Magazine of the Society and Economy 2020/2. (as a result communication of the „*Innovation, Integration and Mobility*” conference),
- Living Longer, Working Smarter, Aging Well volume of conference proceedings,
- Köz-Gazdaság Magazine of 2020/2. (as a communication from the „*From Digital Nomads to Remote Companies*” and „*Living Longer, Working Smarter, Aging Well*” conferences)
- „*Labor Market Trends – Demographic and Welfare Challenges*” book, the final volume of the project.

With the support of the project, 12 internationally renowned professors were invited to hold highly successful master classes, which also provided opportunity to discuss joint research opportunities. We have signed cooperation agreements with three internationally renowned universities and research institutions. We have participated in several local and international conferences and our research results have been published in internationally recognized journals.



In accordance with the main objectives of the project, a significant number of young researchers and students were involved in the researches of Main direction III. In the case of young researchers, instead of involving 8 researchers as planned, at the end we worked together with 17 talented young people to achieve the goals of the project. In the case of the students, we were able to ensure the participation of 24 people instead of involving 5 people as planned. Thus the number of participants in the programs facilitating research recruit involvement was 41 and not just 14 as originally planned.

This means that we relied intensively on the creativity of the target group, the young people who provide the research supply, and at the same time helped them to get involved in our research and training as effectively as possible. As a result, we could raise the number of the doctoral students from 2 to 3, who also took a step up, defending their dissertations with excellent results.

The research results of the project have been presented at several national and international conferences. The young researchers gave 42 lectures at local and international scientific conferences, which was more than 50% more as we had planned originally. We feel that participation in these events (both for the target group and for the professional implementers) can effectively help the Corvinus University of Budapest to become intensively involved in international research networks.

We have established new research collaborations. In 2018 we participated in the international ADAPT conference (Association for

International and Comparative Studies in Labor Law and Industrial Relations) and negotiated, as a result of which we concluded a cooperation agreement in 2019 on lifelong learning, vocational education and training, labor economics, human resource management and research regarding industrial relations.

In 2020, we entered into an agreement with Josip Juraj Strossmayer University on a collaboration in research in discrete mathematics, graph theory, integer programming and set a goal for our joint participation in international research networks.

We also signed a cooperation agreement with Jagiellonean University in Krakow on research in the fields of lifelong learning, vocational education and training, labor economics, human resource management, labor law and industrial relations and we plan to join international research networks. The Corvinus University of Budapest has concluded three cooperation agreements altogether for international research purposes, which can effectively help our further integration into international research networks.

As a member of an international consortium, we submitted an H2020 project named „The many Paths to the Future of Work: Intelligent Policy Solutions for Inclusive Growth in Europe- iPATH”.

The fact that with the support of the project we had the opportunity to invite 12 internationally renowned professors, who held masterclasses in a number of topics intensively researched in economics, and with whom we had the opportunity to discuss possible additional areas of cooperation also contributed to the expansion of our international cooperation opportunities.



VISITING ACADEMIC RESEARCHERS FROM EU / EEA MEMBER STATES AND THE CARPATHIAN BASIN

1. Jeremias Prassl: Humans as a Service: The Promise and Perils of Work in the Gig Economy
2. Fóti Klára: Labour Market and Social Policy Relations in the European Union
3. Daniel Samaan: Social Impacts of Future of Work
4. Arkadiusz Wisniowski: Applied Demography
5. Asghar Zaidi: Positive Paradigms of Ageing, Including Active and Healthy Ageing
6. Andrew Cairns: Mortality trends and modelling methods
7. Carl Benedikt Frey: Capital, Labor, and Power in the Age of Automation
8. Ilyas Vali: Future of Redistribution (2019)
9. Moritz Hess: Demographic Ageing in Europe: How will it affect the Economy and Welfare State? And what Job Opportunities for Economist might arise from it? (2020)
10. Ronald Richman: Mortality modelling with deep learning: recent advances and future outlook (2020)
11. Jolanta Perek-Białas: Contemporary Perspectives on Ageism, Highlighting Labour Market Consequences (2020)
12. Massimiliano Mascherini: „Living, Working and COVID-19”

As the member of an international consortium, we submitted an H2020 project entitled „The Many Paths to the Future of Work: Intelligent Policy Solutions for Inclusive Growth in Europe- iPath”. 74 people took part in our R&D & I training sessions, 114 publications were made as a result of the project, 41 of which were published in English.

Number	Indicator, name of quantifiable results	Unit	University of Pannonia	
			Goal	Fact
L_1	Number of participants in programs supporting the supply of researchers	Persons	14	41
SZE_1	Number of new participants involved in researcher support programs	Persons	5	24
SZE_2	Young researchers contributing to the project	Persons	8	17
SZE_3	Young researchers in the project who receive formal „level step” or international award	Persons	2	3
SZE_4	Number of the supported domestic and international scientific conference presentations	Number	27	45
SZE_5	Number of newly established or new research cooperation content higher education institution, research site collaborations	Number	3	3
SZE_6	Number of higher education visiting researchers from EU/EEA Member States and the Carpathian Basin	Persons	12	12
SZE_7	Number of the potential Horizon 2020 collaborations achieved during the project	Number	7	10
SZE_8	Number of the participants in trainings a trainings for R+D I purposes and content, research skills development	Persons	45	74
SZE_9	Number of publications created within/as a result of the project	Number	30	114
SZE_10	Number of foreign language articles created/result of the project	Number	18	41

PROFESSIONAL RESULTS OF THE UNIVERSITY OF PÉCS

SUMMARY OF THE MAIN PROFESSIONAL RESULTS OF THE PTE FACULTY OF BUSINESS AND ECONOMICS

Within the framework of the project, the PTE FoE led Main Direction I named „Identification of the factors determining regional success and competitiveness, modeling”, as well as the research carried out in the field of five sub-projects within the main direction. The sub-projects focused on important factors of modern and regional development: studies of regional innovation systems, business ecosystems, corporate innovation, small business competitiveness and the role of the universities in regional development. Significant emphasis was placed in the analyses on economic model developments and impact analyses related to smart specialization policies. In addition to the European dimension, our main focus was on a very strong focus on Hungarian research, especially on the region of Pécs. Main Direction I is very active in publishing, with an emphasis on high-quality international and domestic scientific publication segments. Several of our Q1 and Q2 studies have been published and several more articles are being reviewed.

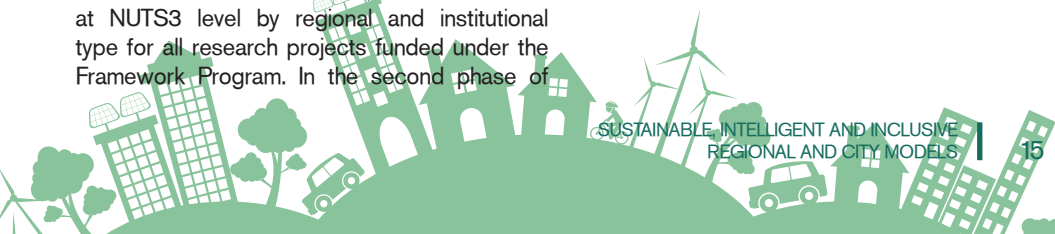
1.1. REGIONAL INNOVATION SYSTEMS

The work of the research group took place along four lines. In the first phase of the project, literature summaries were prepared on the basis of which we developed an integrated model framework in which we placed regional innovation systems and entrepreneurial ecosystems. An extensive database was developed as a sub-goal throughout the project, resulting in a complete Europe-wide data table at institutional level, with identification at NUTS3 level by regional and institutional type for all research projects funded under the Framework Program. In the second phase of

the database development, a patent database was acquired and from this we connected the patented institutions with the institutions listed in the Framework Program data table by NUTS3 region. The fourth strand of the project used the results of the database construction, the detailed territorial and institutional breakdown of the FP cooperation networks and the analysis of these networks.

1.2. REGIONAL CORPORATE SURVEYS: REGIONAL CORPORATE ECOSYSTEM AND CORPORATE COMPETITIVENESS OF URBAN REGIONS IN HUNGARY

The research group continued its analyses at the level of the EU and domestic regions. By developing new indicators to measure entrepreneurial activity at EU regional level, the group found that innovative, Schumpeterian-type enterprises are the key to economic growth in the regions, and Kirzner enterprises, which are largely based on replicating existing ideas, do not really play a role. The results of the entrepreneurial index surveys prepared for Hungarian urban regions were also a novelty. In all cases, the performance of the entrepreneurial ecosystem of Hungarian urban regions lags behind what would be expected based on their development. Individual company studies have shown that our small companies have improved their competitiveness by about 15% compared to the previous period (2013/2016). For innovation-driven competitiveness strategies, we found that three functions, management, research and development, and, to a lesser extent, marketing play an important role.



I.3. INVESTIGATION OF THE REGIONAL ECONOMIC EFFECTS OF THE UNIVERSITY OF PÉCS

In addition to the literature review, we conducted several empirical examinations. In order to explore the potential of the university's research and development portfolio, we reviewed PTE's research portfolio and identified those that, based on the available information, may be suitable as a basis for priority areas interpreted in the framework of smart specialization strategies. As part of the empirical research, a university-wide survey was conducted to measure the value preferences of university lecturers and researchers, and to map staff perceptions of the system and framework conditions of the developed and published university-centered entrepreneurial ecosystem concept. When measuring the expenditure effects of the university, we calculated the employment, gross output and gross value added effects derived from the costs of PTE staff and students.

I.4. CORPORATE INNOVATION AND ENTREPRENEURIAL CAPACITY STUDIES IN THE REGION OF PÉCS

The group studying corporate innovation in the urban region of Pécs studied the IT sector in the first phase of the research, as well as the functional attributes of the ecosystem and the role of the University of Pécs in the entrepreneurial discovery process. In parallel, the development of a conceptual framework for a university-centered entrepreneurial ecosystem has begun.

On the basis of the conceptual framework, a protocol capable of assessing the university entrepreneurial ecosystem was created, which was registered as know-how by the University of Pécs, and for which a so-called ecosystem management software was developed under the brand name "openup.education".

I.5. FURTHER DEVELOPMENT OF THE HUNGARIAN GMR-TYPE MODEL AND PERFORMANCE OF ALTERNATIVE DEVELOPMENT POLICY IMPACT ANALYSES IN THE URBAN REGION OF PÉCS

The research group made multi-directional developments in the GMR-Hungary model: developments in the areas of urban region modeling, a new labor market block, internal migration modeling and the addition of a system dynamics model to the TFP block. We performed a wide range of analyses with the models, with a strong emphasis on the economic impact assessment of smart specialization policies. We performed periodic impact modeling of smart specialization subsidies in the Portuguese Centro region, our Hungarian government used the prioritization model calculations in the construction of the new Hungarian smart specialization strategy, we analyzed the expected economic effects of promising innovative ideas in Pécs and the impact of infrastructure development on labor migration. Our research findings on the impact analysis of smart specialization are of great international interest.



SUMMARY OF THE MAIN PROFESSIONAL RESULTS OF THE PTE FACULTY OF SCIENCES

During the three-year long consortium cooperation, the Department of Tourism of the Faculty of Science of the University of Pécs In the framework of sub-projects II.3, II.4 and II.67 of the main direction “Social and environmental sustainability model in natural and cultural heritage management”, the tourism demand, supply, trademark systems, tourism institutional system and heritage management of the Southern Transdanubia Tourist Region were examined.

The basis of the professional activities was a joint assessment of the guests, which attempted at evaluating the image by soliciting the opinion of tourist visiting the region. Then we evaluated the specific issues of the project in the tourist region using innovative research methods well-known and widely applied in academic circles, or ones that were formulated by ourselves in the spirit of problem identification, proposal making and sustainability.

II.3. REGULATION OF HERITAGE PROTECTION, WAYS OF OPERATION OF HERITAGE MANAGEMENT- INTERNATIONAL INVESTIGATION

The project element was broken down into domestic and international research units. In Hungary, the focus of the guest survey was primarily on the elaboration of the heritage and image elements and the processing of the results. On this basis, professional publications were produced to complete the research of the sub-project, on the other hand and mainly to support

the individual research paths and professional development of the participating PhD students.

The heritage sub-project carried out activities in two fields in order to accomplish its mission:

1. International and domestic legislation, and the examination of the institutional background of the heritage protection.

2. Heritage protection and comparative studies into heritage management, Central and Eastern European towns of historic and cultural interest, as destination hubs: Pécs - Graz - Maribor

We explored ways of utilizing the heritage through local research, deep interviews and field trips and by comparing the outputs of tourism. We looked into some of the contrasting aspects of heritage protection and of tourism, the ways toward their realization, seeking out the good examples.

The completed research reports and case studies properly back up the academic curriculum as well.

II.4. EXPLORING THE SYSTEM OF TOURISM INSTITUTIONS FROM AN INTERNATIONAL PERSPECTIVE

In the examined period, the system of tourism institutions and management in Hungary is experiencing an era of paradigm shift, the focus of our research was on this, looking for a comparison with the similar institutional systems of Slovakia and Ukraine / Transcarpathia. There were fundamental differences in the legal background (Slovakia) in the application dependency (Hungary) and in the forms of organization (Transcarpathia). Our methodological novelty is the typification of Hungarian TDMs with a complete cluster analysis, as well as the nuance of the basic destination life cycle model on the example of Orfű. In addition to the formal networks (TDM, cluster, thematic route), the research of the activating informal co-operations in the Southern Transdanubian Tourist Region has brought significant results. Turisztikai Régióban az aktivizálódó informális együttműködések kutatása hozott számottevő eredményeket.



II.6. AND II.7 TRADEMARK SYSTEMS, INNOVATION POWER, DEMAND AND SUPPLY CONDITIONS OF LOCAL PRODUCTS IN THE SOUTHERN TRANSDANUBIAN REGION, AS WELL AS THEIR TOURISM UTILIZATION



The sub-project examining the trademark systems and innovation power of local products approaches the problems of local products in Southern Transdanubia from two directions. On the one hand, following the tourism trends, joining the "locavore" line, on the other hand, we examine their role in image and image development in relation to the destination.

The local product, which is linked to landscape, production conditions and traditions - thus carries authentic value and can therefore be interpreted as an attraction - shows a characteristic thematic and territorial location in tourism. A significant concentration of local products can be seen

in South Baranya and the Mecsek region. The Villány Wine Region can be delimited as a particularly important focal area.

The spontaneous responses of the tourists interviewed in the 2018/2019 representative guest survey clearly interpret the product and regional brands that define the region, such as wine (be it Villány or Szekszárd), honey, or even sausage, stífolder.

During the research process we organized one domestic, two international conferences and two foreign professional workshops:

2018: IX. National Conference of Tourism,
2018: „Hexagonal” international conference,
2020: „Paths in tourism” X. National Conference of Tourism.

2019: Maribor workshop

2019: Graz-Oststeirenmark-Nyitra workshop

In connection with the events, we carried out intensive publishing activities in the coordination of the project, and published several volumes.:

- Paths in Tourism”. Bilingual abstract volume of the 10th National Tourism Conference.
- Case studies from the Southern Transdanubian Tourist Region. Bilingual study volume. Bilingual concluding volume of the project (under construction). With the support of the project, 6 foreign visiting researchers joined our research activities. Working together with them made it possible to compare our results at the international level, thus creating high-quality international publications.



PROFESSIONAL RESULTS IN NUMBERS OF THE UNIVERSITY OF PÉCS

FACULTY OF BUSINESS AND ECONOMICS

1. Our achievements in the field of researcher supply

We provided participation for 19 researchers in our work, who work as teaching assistants and assistants at the PTE FoE. We also involved 5 students who were new to the field of scientific research. The number of **young researchers participating in the project was 14**. 5 of our young fellow researchers stepped onto the next level, earning degrees. Our level of progress is five researchers. In order to support the young generation, we also organized **R & D & I training sessions** with 67 participants.

2. Our achievements in the field of international relations

We submitted several H2020 applications, one of which received support. We have a total of **28 potential partners** and five actual partners for research proposals. Our main direction was also active in the establishment of international institutional cooperation agreements, **5 new agreements** have already taken shape.

3. Publication activities, guest research invitations, conference presentations

In the framework of Main Direction I, we placed great emphasis on the further expansion of the quality international relations of our colleagues. We invited ten renowned researchers for visiting research from Western European universities. As a result of the researcher relationships, new studies will be born, which will appear in the international trade press in the near future.

Main Direction I is very active in publishing, with an emphasis on high-quality international and domestic scientific publication segments. Several of our Q1 and Q2 studies have been published, and several more articles are in the review phase. In the field of publications, we can report **55 studies** so far, but with the acceptance of articles sent to journals, we hope that this circle will increase significantly. We were also active in the areas of domestic and international conference visits. We held **17 conference presentations** in Hungary, Europe and the United States.



FACULTY OF SCIENCES

The professional work also offered an opportunity to involve **young researchers**. A total of 15 people were involved in the researcher support program, including 1 teaching assistant, 1 research assistant, 10 PhD students, 3 demonstrators (two of the latter later as PhD students continued their research activities in the project).

The professional level step, which is one of the main indicators of the project, was realized in the case of two young researchers. One of our colleagues moved from a research assistant to a research associate, and another of our teaching assistant colleagues was appointed as an assistant professor.

Conference appearances were treated as a priority both domestically and internationally. The results of the research carried out in each sub-project were presented to our interested parties in the framework of **62 conference presentations**, 16 times abroad.

As a result of the virus situation, we were able to implement two of the four planned

international workshops. On October 28-29, 2019 we visited Maribor, between 1-5 April 2019 and we took part in the Graz-Oststeiermark-Nitra professional trip, where the program was thematically structured, supporting the progress of our research by visiting inspiring attractions, experts and institutions for the sub-projects. The workshops also proved to be useful for the international visibility of the project, as two visiting researchers from Graz and one from Nitra joined the project with a scholarship.

We managed to establish new research collaborations with foreign higher education institutions and researchers, a total of 4, with the Constantine Philosopher University in Nitra, Slovakia, the Il. Ferenc Rákóczi with the Hungarian College of Transcarpathia, the Partium Christian University in Oradea and the Austrian University of Graz.

Taking advantage of the opportunities offered by the project, we announced the "Research Fellowship for Foreign Teachers" three times from Oradea, in which researchers were contributing from Nyitra, from Graz and from Beregszász.



CORVINUS UNIVERSITY OF BUDAPEST

HIGHLIGHTED PROJECT ELEMENT

PUBLISHING OF THE BOOK „LABOR MARKET TRENDS – DEMOGRAPHIC AND WELFARE CHALLENGES”

Researchers of Main Direction III have published a book analyzing the longer-term labor market challenges of the Hungarian economy. The diversity of the topic and the many points of connection between the individual research areas required that the issue be explored and analyzed from many sides. A deeper understanding of the future “new world” of the labor market can also form the basis for the development of a labor market strategy that will effectively help the Hungarian economy to catch up quickly in an aging society, also along new types of welfare expectations.

THE FIRST PART outlines the expected demographic overview of our country. It analyzes the longer-term problems that can be detected in the Hungarian population processes in the light of the expected mortality and longevity trajectories, as well as its effects on the pension system and its future sustainability. Mortality was analyzed by age group, based on a detailed analysis of mortality curves, we examined the range of countries in a similar situation by cluster analysis. With the help of a demographic model based on microsimulation, we made a regional forecast for the development of the Hungarian age tree by 2030. We analyzed retirement expectations through an online questionnaire: the majority of respondents assume that they will not receive even half of their active income as a state pension and expect a slight increase in the retirement age.

THE SECOND PART discusses the labor market challenges arising from the aging of society, analyzes the perspectives of active aging, and the chances of older people to participate in new types of employment. The results of experimental model calculations suggest significant age discrimination. The analysis and forecasting of the labor supply of the elderly is an important research question, therefore, with the help of a questionnaire survey, we analyzed the willingness of older workers to continue working and their drivers. According to our results, increasing well-being at work through corporate and government means (flexible, “age-friendly” workplaces, contribution reductions) can help increase activity in old age in the long run.

THE THIRD PART discusses some special topics that characterize the present and future of the domestic labor market. One of the important starting points of the labor market analysis of the labor market is the extent to which internal motivation can be mobilized during the choice of profession. Another current problem of the domestic labor supply is the labor shortage caused by migration, therefore we have analyzed the drivers of emigration intentions using an econometric model. The coronavirus crisis of 2020 is also expected to reorganize global production and value chains, and we have predicted their expected effects on domestic employment. We analyzed an atypical form of employment, teleworking, from the perspective of employees, employers, and the regulatory state. We use a microsimulation method to examine the medium-term development of the proportion of telework in Hungary by sector and region.

THE FOURTH PART reviews the welfare dimensions of the labor market, discusses changing perceptions of work, and analyzes the links between well-being at work and long-term productivity, with particular reference to the new generation's expectations of the future workplace. The results showed that students rated professional development, career opportunities, and the existence of professional challenges as the most important, while for employees, disposable income had already become the most important job selection criterion. Using a panel model, we also prove that there is a significant relationship between economic development and the spread of telework. One important area of welfare research is how to improve the well-being of the elderly. Our results suggest that the participation of older people in the tourism sector (as employed and as tourists) can improve the well-being of this age group, at the same time stimulate the labor market and improve economic performance.

Overall, the volume analyzes the current and future labor market situation and prosperity prospects of the young and older generations, based on the conditions of the Hungarian demographic situation.

UNIVERSITY OF PÉCS

HIGHLIGHTED PROJECT ELEMENT

CONFERENCE WITH INDEPENDENT SECTIONS AND CLOSING VOLUME

I. Independent conference sessions

In honor of the 50th anniversary of the founding of the PTE FoE, the Faculty organized an online conference entitled "Change, Redesign and Development". At the conference, we presented the most important results of Main Direction I in four separate sections and a round-table discussion, and we invited renowned international and domestic researchers to give presentations on the topics of our research.

Our sections were the following:

1. Smart specialization policies in lagging regions
2. Universities in RIS3 and in the entrepreneurial ecosystem
3. Networks, development and disparities NetWorkShop I.
4. Networks, development and disparities NetWorkShop II.
5. University-centered entrepreneurial ecosystems. Round table - co-organized by RIERC and openup.education

A XVI. At the conference of economic modeling experts, we presented our analysis tools developed in Main Direction I and the results of several model calculations in six lectures in a separate section.

Lectures were given on our network position index and our achievements in monetizing the REDI index, which measures the level of development of the business ecosystem.. Among our studies with the GMR-Hungary model, we presented our study analyzing the relationship between infrastructure development and commuting, our results in the impact analysis of smart specialization policy, and our research work using system dynamics modeling. Our results using the REDI index were presented in a presentation that analyzed the relationship between the optimization of entrepreneurial development processes and smart specialization in the regions of the European Union. Our lectures appeared in the abstract volumes of the two conferences.

II. Collective study volume

A book entitled Innovation, Entrepreneurship and Regional Economic Growth is produced, in which we present the most important research results of our project in the last three years in 22 studies.

The volume discusses the results in four groups:

1. Territorial innovation systems, innovation networks, smart specialization
2. Business ecosystem and small business competitiveness
3. Universities and regional development
4. Impact modeling in economic development: intelligent specialization, universities, transport development



UNIVERSITY OF PÉCS HIGHLIGHTED PROJECT ELEMENT TTK

„PATHS IN TOURISM”

X. NATIONAL TOURISM CONFERENCE

The Department of Tourism of the University of Pécs has carried out diversified research activities in several sub-projects within the framework of the project. The first of these focused on the regulation of heritage protection and the ways in which heritage management operates, the second on the exploration of the system of tourism institutions embedded in the international context, and the third on the innovation power, demand and supply of local branding systems.

The results of the multi-year research work and professional collaborations are to be presented at the X. National Tourism Conference, the section breakdown of which was also adapted to the project:

I. Section: *Local tourism based on local inspiration*

II. Section: *Collaborative Tourism Strategies*

III. Section: *New brands in the countryside*

IV. Section: *The issue of sustainability in tourism*

V. Section: *International Section (lectures in English)*

Due to the epidemic situation, the event was finally held online on October 2, 2020, where more than 90 participants in 5 sections were able to listen to nearly half a hundred lectures in two languages. The English-language section offered an opportunity for our foreign visiting researchers, among others, to present our joint research results.

We have published a bilingual abstract volume from the abstracts of the presentations given at the conference both in printed and electronic versions:

– „Paths in Tourism ”- the bilingual abstract volume of the 10th National Tourism Conference. In line with the professional event, we also prepared our volume of case studies related to the project, which was completed in both printed and electronic versions:

– Case studies from the Southern Transdanubia Tourist Region. Bilingual study volume. I

– At the end of the project, we will publish the professional results of the past three years in a research volume. This volume focuses mostly on professional activities and research results arising from international collaborations. It is currently in the editing phase. It will be published in Hungarian and English in printed and electronic format soon.

The three volumes available online are available here: <http://www.eturizmus.pte.hu/>

UNIVERSITY OF PANNONIA

HIGHLIGHTED PROJECT ELEMENT

ESTABLISHMENT OF A MARKETING FOCUS LABORATORY
AT THE UNIVERSITY OF PANNONIA

INNOVATION IN FOCUS

In addition to its educational activities, the University of Pannonia places significant emphasis on innovation and research projects. An innovative marketing research infrastructure was established as a key element of project at the University. As a result of the unique investment, a Marketing Focus Laboratory equipped with an eye-tracking camera was established, which was inaugurated in the fall of 2020.

The research space, which primarily serves economic disciplines, is suitable for conducting academic, consumer or business / corporate qualitative research (focus groups and individual (in-depth) interviews).

To build the facility, the university carried out a renovation of 170 m² (complex renovation and conversion works to suit the needs).

A unique audio and video system was set up to carry out the examinations and research in the Focus Laboratory, and special equipment - fixed and mobile eye cameras, interactive whiteboards - was procured. Implementation covered almost the entire project duration, 2,5 years of work. Total cost of the investment: gross HUF 56.5 million .

As part of the investment, a focus group room for 12 people was created, to which a 6-person observation room equipped with a detective mirror (from which the progress of



the research can be monitored) is connected. In addition, the research facilities: an internal corridor, which functions as a reception area, an exhibition space, a hall with a kitchenette and tables for receiving and prefiltering participants, and a technical room for data recording and processing.

The aim of the Marketing Focus Laboratory is to make the experience and scientific results gained during university research widely available to its corporate partners by expanding

the service portfolio of the institution. The investment has created an infrastructure suitable for the provision of innovative services, which is based on the wide-ranging expertise and international experience of the lecturers of the Faculty of Business Administration. Focus laboratory equipped with an eye camera helps the work of product developers, marketing specialists and analysts with the most modern research tools.

The Marketing Focus Lab has mobile and fixed Tobbi eye cameras: the Tobbi Pro Glasses 2, which covers interiors such as Tobbi Pro Spectrum, which allows you to examine content projected on a screen. Eye tracking is a widely used research method in both the scientific and business worlds.

The eye camera is able to track and record the movement of the human eye, so it is also possible to track what the consumer is paying the most attention to, and is able to measure subconscious (stimulus-driven) processes. With the help of the eye camera, the support of consumer feedback is more reliable, among other things, it is suitable for optimizing printed and online surfaces (for example, publications, billboards, visual content), sales pages, websites, and making it user-friendly. After a few minutes of calibration, the device is ready for testing and the device can be used to accurately test the effectiveness of any interior or screen surface.



In the focus laboratory, it is possible to test products, explore the emotional background related to services, learn about customer satisfaction, and learn more about consumer preferences. The Marketing Focus Lab is suitable for conducting qualitative research based on the orders of corporate partners, assisting the work of sales and marketing staff, advertisers, advertising designers, developers and / or any user facing a corporate / consumer decision.



INTRODUCTION OF CONSORTIUM MEMBERS



UNIVERSITY OF PANNONIA

The University of Pannonia is a key higher education institution in the Central Transdanubian Region. The training offer of an institution with a serious professional tradition and a long history covers almost all fields of science except a few. Our multidisciplinary university has five faculties, providing an unparalleled opportunity to acquire state-of-the-art knowledge in economics, technical informatics, social sciences, natural sciences, and various engineering and technology sciences. The scientific weight of the institution is indicated by the accredited doctoral schools of the week, research of international standard and recognition, various academic and professional awards and recognition. Our university is a key player in economic development, promoting the integration of the private sector, business, local governments and central government in regional and cross-border education, research and development programs. Our goal is to further strengthen our role in the economic, socio-cultural and innovation development of the region so far.

CORVINUS UNIVERSITY OF BUDAPEST



Corvinus University of Budapest is Hungary's leading university in the field of economic and social science courses. The medium-term goal of the renewed BCE, which has been reserved by the foundation since 1 July 2019, is to become the best higher education institution in these areas, not only nationally, but also in Central and Eastern Europe. The university was launched in 2019. Nearly 12,000 students, including 3,500 foreign students are currently studying on BCE campuses in Budapest and Székesfehérvár. The institution has close relationships with 300 partner universities worldwide. The strengths of our courses are the practice-oriented approach and active market relations, and the performance-based Corvinus Scholarship System encourages students to produce outstanding results. BCE regularly achieves a prominent position in the international higher education rankings, with the region's first place in the Eduniversal's 2019 ranking with its "Management and Management" training, and its "Masters in Management" ranking in the Financial Times in 2020 with its "Management and Organization" master's degree made it one of the 100 best business schools in Europe. This is due, among other things, to the fact that the University operates more than 20 internationally recognized research centers, and its doctoral schools cover 7 educational areas. A significant part of Hungary's economic, political and academic elite can also be found among the students graduating from Corvinus, but an important goal of the University's Renewal Program is to provide its students with a degree and knowledge that can be used in the international labor market by providing more and more high-quality English language training programs.



UNIVERSITY OF PÉCS

The University of Pécs (PTE) is not only the regional university of Pécs, but also of Southern Transdanubia. The largest employer in the city, it plays a decisive role in all intellectual fields of the region, in arts, science and healing. In line with international and domestic research policy objectives, and in line with the conditions of the South Transdanubia region, the University of Pécs intends to focus its intellectual, infrastructural and financial capacities on areas of great potential that can serve the region's knowledge-based, innovation-oriented economic development strategy.

The University of Pécs is one of the largest higher education institutions in Hungary with a student population of 20,000, 1,600 lecturers, researchers and 10 faculties. With its roots dating back to 1367, it is the first university in Hungary. Meanwhile, it is one of the most important research universities in the country, with a huge professional research base. There are 22 doctoral schools in the university faculties, covering a wide range of sciences and arts. The University of Pécs attaches an important role to nurturing talent. Vocational colleges and academic student groups aim to support students' scientific work.

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