Budapest University of Technology and Economics

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EXAMINATION OF THE DOMESTIC SPECIALITIES OF REGIONAL RESILIENCE AND SUSTAINABLE DEVELOPMENT

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1 Introduction – Research background

The adaptation to various shocks due to the interrelatedness of todays' economic sphere and the importance of the assessment of those factors which determines regions' response have contributed the ascending importance of regional resilience studies. Expressions like 'Post-9/11 period' or 'Post-2008 World' both call the attention to global external effects.

In Autumn, 2010 the 'Cambridge Journal of Regions, Economy and Society' published a thematic issue concerning scientific background and empirical research possibilities of regional resilience. The essence is that it is quite obvious that local economies are sensitive to the changes of the global economy, besides that regional development is far from a smooth and incremental process, instead as Walker (2004), UNISDR (2005), Foster (2006), Cutter et al. (2008), Simmie-Martin (2010) and Palekine et al. (2015) point it out it is the subject to all sorts of interruptions and disruptions (such as periodic economic recessions, the unpredictable rise of major competitors, unexpected plant closures, the challenges arising from technological change and the like.

The subject for economic processes' analysis, regions are unit of social-economic space, characterized by:

- production structure of all ownership forms,
- population, employment concentration;
- as well as governmental institutions; fundamentally, a social, cultural, political and economic interaction system (Agnew, 2000, 2001; Haukkala et al., 1999 in Palekiene et al., 2015)

The topic of the dissertation is in line with 1/2014. (I. 3.) National Legal Document *'National Development 2030:*

National Development and Territorial Development Concept' since in a country with dual economy where the employment condition is sensitive to high extent to the location choice of transnational companies the topic is relevant to high extent (respectively to local effects due to the changes of the local economy).

2 Objectives and research methods

The aim of the Ph.D. dissertation on one hand is to demonstrate the range of those territorial factors which importance ascends in the field of the emerging new, influential concept: regional resilience, on the other hand to provide interpretation on how the advantageous and harmless management of natural resources could be implemented in order to establish and maintain conditions for humankind supported by economic development which does not exceed the carrying capacity of the ecosystem. Ascending importance of the regional resilience concept is due to various economic and social shocks which have called the attention to the different level of adapting capacity of regions, territories; in my research it has high importance what is the influence of the material and immaterial (like social relations and endogenous knowledge) resources in formulating adaptive capacity of the regions according to the environmental- economic- social- and institutional dimensions of the sustainable development. It is a dedicated aim of the dissertation to integrate the regional research with sustainability matters; while several steps have been taken to embed territorial dimension in the concept of sustainable development, as the emerging concept of 'regional sustainability' demonstrates, the changes of nowadays economic and political conditions the

research focus must be widened with the regional resilience perspective.

Both personal and professional experiences have contributed to my growing interest concerning regions as complex systems, since if changes and external economic or natural shocks follow one by one that what kind of resource portfolio of material and immaterial resources, arrangement is required in order to ensure the sustainability of inner knowledge base? How does a territory become able to both retain population create new values and preserve the old ones? These questions link sustainable development (described by the classical 'environment – economy - society' and institutional pillars) and regional resilience (the adaptability of the regional resource portfolio for inevitable economic-, social-, political etc. shocks), furthermore it underlines the evolutionary nature of the regional development process.

The Ph.D. dissertation has two main sections; the first one is the literature review, the second one is the empirical research. The main research question of my dissertation is the following:

How does the interrelationship between sustainable development and regional resilience could be assessed and how do spontaneous allocation of capital (location choice) and fund allocation policy (European development projects) affect regional resilience through sustainability?

The Ph.D. dissertation examines the research question through three research topics (the second one has two subtopics):

1. resilient regions from sustainability perspective;
2. effects of spontaneous allocation of capital (location choice) on regional resilience through sustainability

(income inequality and sectoral diversity point of view);

3. effects of fund allocation policy (European development projects) on regional resilience through sustainability.

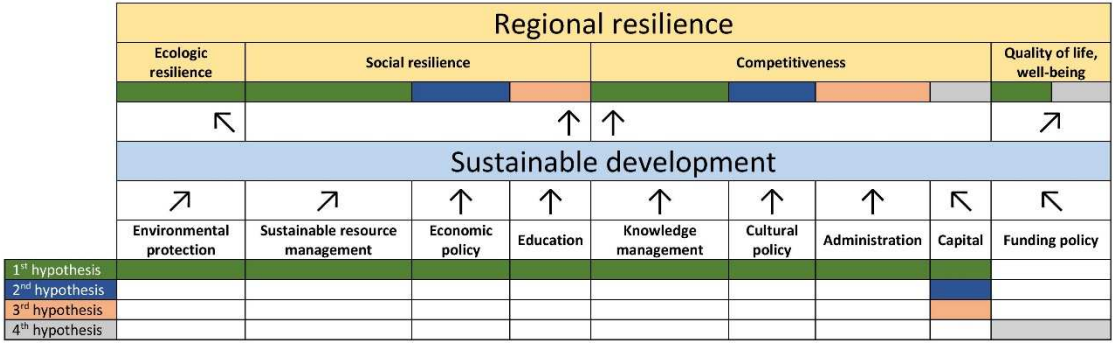
The next table shows the concrete research questions of the topics, hypotheses and the research methods applied.

1. table: Research questions, hypotheses and applied research methods
(own compilation)

	Research question	Hypothesis	Research method
1.	How does the interrelationship between sustainable development and regional resilience could be assessed?	The interrelationship between sustainable development and regional resilience can be assessed by the analysis of change of the importance of factors in the city region resource portfolio.	Qualitative analysis of regional development throughout the pillars of the sustainable development in order to assess resiliency.
2.	How does spontaneous allocation of capital (location choice) affect regional resilience through sustainability? (Income inequality point of view)	The spontaneous allocation of capital after 1990 (which affects the location choice of TOP 500 companies with the best sales performance) concentrates at territories with higher sustainability potential along the 'West-East' declination in Hungary.	Assessment of the change of the TOP 500 companies with the best sales performance in 2013 and 2016 in their location (for seats respectively).

	Research question	Hypothesis	Research method
3.	How does spontaneous allocation of capital (location choice) affect regional resilience through sustainability? (Sectoral diversity point of view)	The level of sectoral diversity is higher in case of territories with higher sustainability potential (at the top of the 'West-East' declination in Hungary) based on the distribution of TOP 500 companies with the best sales performance on county level, hence there are great differences in the regional adaptability levels.	Assessment of the distribution of TOP 500 companies with the best sales performance in 2016 according to their seats and sectors they operate in using both qualitative and quantitative methods, including visualisation tools.
4.	How does fund allocation policy (European development projects) affect regional resilience through sustainability?	Against the spontaneous trends of location choice of enterprises the development of sustainability potential aiming reducing uneven income distribution through the fund allocation policy of the European Union between 2007 and 2013 was not influenced by the political change in the system in Hungary.	Consistency analysis of two regional centres concerning the continuity of their Pole role through analysing funded projects in the Green Economic Development Programme (all funded projects) and Science–Innovation Programme (10 projects with the largest budget) between 2011 and 2013.

The next figure represents the research model of the dissertation.



1. figure: The research model of the dissertation
(own compilation)

Through the four hypotheses I examine nine specific input factors of sustainable development. The essence of the research model is that I examine specific input factors from the range of factors enabling regional sustainability, how do they influence the long-term viability of territories which means regional resilience trough the ecological and social adaptation of territories, competitiveness, maximization of well-being, increasing the level of quality of life.

3 New scientific results

This Ph.D. dissertation aims, on one hand, to demonstrate the range of those territorial factors whose importance ascends in the field of emerging influential concept: regional resilience, and on the other hand, provide interpretation on how the advantageous and harmless management of natural resources could be implemented in order to establish and maintain conditions for humankind supported by economic development that does not exceed the carrying capacity of the ecosystem.

It is a dedicated aim of the dissertation to integrate regional research with sustainability matters; while several steps have been taken to embed territorial dimension in the concept of sustainable development. As the emerging concept of 'regional sustainability' demonstrates the changes of nowadays economic and political conditions, the research focus must be widened with the regional resilience perspective. The concept has special importance both in terms of calling attention to the effects of the global economy on local wealth and well-being circumstances and the actual Hungarian dual economy where the employment condition is sensitive to a high extent to the location choice of transnational companies.

For the analysis four hypotheses have been set up through I examine nine specific input factors of sustainable development *(environmental protection, sustainable resource management, economic policy, education, knowledge management, cultural policy, administration, capital and funding policy)*. The essence of the research model is that I examine specific input factors from the range of factors enabling regional sustainability, how do they influence the long-term viability of territories which means regional resilience trough the ecological and social adaptation of territories, competitiveness, maximization of well-being, increasing the level of quality of life.

2. table: Research questions, hypotheses, hypotheses' acceptance or decline, research methods, new scientific results and own reference
(own compilation)

How does the interrelationship between sustainable development and regional resilience could be assessed and how do spontaneous allocation of capital (location choice) and fund allocation policy (European development projects) affect regional resilience through sustainability?						
	Research question	**Hypothesis**	**Proved/ declined**	**Research method**	**New scientific result**	**Own reference**
1.	How does the interrelationship between sustainable development and regional resilience could be assessed?	The interrelationship between sustainable development and regional resilience can be assessed by the analysis of change of the importance of factors in the city region resource portfolio.	Proved	Qualitative analysis of regional development throughout the pillars of the sustainable development in order to assess resiliency.	Throughout historical case study it is proved that the development of regional resources (sustainability) ensures the adaptation capacity against external shocks.	4.

How does the interrelationship between sustainable development and regional resilience could be assessed and how do spontaneous allocation of capital (location choice) and fund allocation policy (European development projects) affect regional resilience through sustainability?						
	Research question	**Hypothesis**	**Proved/ declined**	**Research method**	**New scientific result**	**Own reference**
2.	How does spontaneous allocation of capital (location choice) affect regional resilience through sustainability? (Income inequality point of view)	The spontaneous allocation of capital after 1990 (which affects the location choice of TOP 500 companies with the best sales performance) concentrates at territories with higher sustainability potential along the 'West-East' declination in Hungary.	Proved	Assessment of the change of the TOP 500 companies with the best sales performance in 2013 and 2016 in their location (for seats respectively).	After 1990, the capital allocation in the reforming Hungarian economy – which determines the spatial distribution of TOP 500 companies with the best sales performance – is in line with the distribution of resources and the economic activities are concentrated at territories with higher sustainability (the seats especially).	1., 3.

How does the interrelationship between sustainable development and regional resilience could be assessed and how do spontaneous allocation of capital (location choice) and fund allocation policy (European development projects) affect regional resilience through sustainability?						
	Research question	**Hypothesis**	**Proved/ declined**	**Research method**	**New scientific result**	**Own reference**
3.	How does spontaneous allocation of capital (location choice) affect regional resilience through sustainability? (Sectoral diversity point of view)	The level of sectoral diversity is higher in case of territories with higher sustainability potential (at the top of the 'West-East' declination in Hungary) based on the distribution of TOP 500 companies with the best sales performance on county level, hence there are great differences in the regional adaptability levels.	Proved	Assessment of the distribution of TOP 500 companies with the best sales performance in 2016 according to their seats and sectors they operate in using both qualitative and quantitative methods, including visualisation tools.	Along the 'West-East' declination line in Hungary due to the external economies of scale and geographical disposition the distribution of enterprises is uneven both in terms of numeration and sectoral diversity, hence there are great differences in the regional adaptability levels.	3.

How does the interrelationship between sustainable development and regional resilience could be assessed and how do spontaneous allocation of capital (location choice) and fund allocation policy (European development projects) affect regional resilience through sustainability?						
	Research question	**Hypothesis**	**Proved/ declined**	**Research method**	**New scientific result**	**Own reference**
4.	How does fund allocation policy (European development projects) affect regional resilience through sustainability?	Against the spontaneous trends of location choice of enterprises the development of sustainability potential aiming reducing uneven income distribution through the fund allocation policy of the European Union between 2007 and 2013 was not influenced by the political change in the system in Hungary.	Decline	Consistency analysis of two regional centres concerning the continuity of their Pole role through analysing funded projects in the Green Economic Development Programme (all funded projects) and Science–Innovation Programme (10 projects with the largest budget) between 2011 and 2013.	Against the spontaneous trends of location choice of enterprises, the development of sustainability potential aiming reducing uneven income distribution through the fund allocation policy of the European Union between 2007 and 2013 due to both the change in the political regime in Hungary and the short time period was not successful.	2.

In order to test the *first hypothesis*, I applied qualitative analysis of regional development throughout the pillars of the sustainable development in order to assess resiliency. The research framework has been used to assess the historical development of Szeged city region. The core part of the frameworks is the 'alteration' through we could comprehend the reactions, the adaptation processes of the territory to changes. The first hypothesis has been proved based on the analysis.

In the *'National Development 2030: National Development and Territorial Development Concept'* chapter 1.2.3. it is declared that our dual economy valorises the SMEs in Hungary. According to the Concept there are large differences between TNCs and SMEs in terms of competitiveness which blocks harmonic territorial development. The *second hypothesis* is dedicated to investigating that the capital allocation resembles or not to the 'West-East' declination in Hungary written in recent scientific literature of regional inequality research in Hungary, meaning that territories with higher sustainability potential concentrates more enterprises from the range of TOP 500 companies with the best sales performance. The more the inequality in the distribution of enterprises the lower is the level of regional resilience since large differences could be assumed concerning the capacity development factors of territories.

The third hypothesis is dedicated to assess how spontaneous allocation of capital (location choice) affects regional resilience through sustainability. Based on the distribution of TOP 500 companies with the best sales performance in 2016 according to their seats and sectors they operate in the sectoral diversity landscape of counties, regions are realized. Christopherson et al., (2010) link regional resilience to diverse economic structure

I assess the adaptability of regions. The analysis carried out has proved the hypothesis.

It is a domestic speciality that the period 2007-2013 have been divided due to the change of the government and in 2010 a new Framework Programme has been introduced. Decreasing the territorial hegemony of the capital, Budapest is one of the major economic development challenge in Hungary for which purpose the Hungarian Pole Programme was an attempt to cope with. The Programme which started in 2007 aimed strengthening economic activity in regional centres in the country in specific economic branches and SMEs they operated in those one. The political changes meant the closure of the program. During the test of the *fourth hypothesis* by the analysis of two regional centre it was analysed that development projects have been realized in line with their ex-pole role to what extent contributed to strengthening local economy from 2011. It must be noted that besides the Hungarian Pole Programme there were other initiatives and programmes aiming at reducing the territorial inequalities, but funds – as it was proved by own analysis – are less efficient is less developed regions where the enterprises have less capital and consequently invest less as well as they are not curious enough to take the responsibility to meet the requirements of maintaining funded projects. The analysis which has been carried out did not prove the hypothesis, since decreasing the hegemony of the capital which contributes to harmonized territorial development was influenced by the political change on the level of the Program.

Analysing regions as complex systems, analysing processes from evolutionary perspective underline the importance of long-term viability, wellbeing as a purpose state. those territories are getting more and more attractive which are

capable to provide the maximum of social utility. These territories must be able to cope with the most urgent challenges of nowadays' economy including social (like extreme poverty or hunger) and environmental (resources' depletion, degradation, decreasing biodiversity) issues. *(As it is underlined in the UN 'Transforming our World: the 2030 Agenda for Sustainable Development').*

It is a key issue for Hungary too, to control these processes, to cope with the challenges written in the *'National Development 2030: National Development and Territorial Development Concept'* concerning sustainability, regional resilience and adaptation by investing into the social capital through renewing and strengthening the national value system to enhance population retention capacity. In order to answer the global challenges (linking to Piketty) more education, higher level of societal righteousness, power distribution and tax paying system are required both inside enterprises and in societies and last but not least, more investments into education and community infrastructure are preferable.

4 Results' exploitation

The research has three main outcomes:

1. the first is the 'Evaluation System of Sustainability for Regional Resilience Analysis', a framework for qualitative analysis of regional development throughout the pillars of the sustainable development in order to assess resiliency;
2. the second is an inventory of the population of enterprises based on the ranking in the TOP-500 list, sector, and location on LAU-1 and NUTS-3 level, thus an analytical tool for interpreting the inequalities of the country and provides sectoral diversity landscape;
3. the last is the literature review of the connection of the regional resilience and sustainable development.

The results of the dissertation can be utilized various ways. The framework could be widely exploited to carry out similar city regions' analysis in order to assess and demonstrate how the different regional development facts' importance change over time. As my research underline the importance of education in forming regions' capacity building factors I believe that I call the attention to its importance in Hungary besides many people's argumentation.

Nevertheless, it is important to note that specific conclusions must be handled with special care, as I must have adopted to external circumstances. When modelling the domestic inequality patterns of the country as data for the location of TOP 500 companies included just seats it must be handled carefully. In case of investigations for smaller territories modelling with concrete locations more precise situation analysis could be carried out.

Continuing my own research, I plan to test the framework on foreign city regions which was historically linked to the test area before; I believe that I could find interesting results based on comparison. Another plan of mine that after comprehending the domestic urban development area I would like to deal with those social or environmental question which are not included in urban development plans.

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