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# **Examining the Factors of Endogenous Development in Rural Areas by Means of PLS Path Analysis**

Theses of PhD dissertation

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## 1. Introduction and topic relevance

The countryside is a unique territory differing from urban settlements, the special characteristics of which are determined by the settlements, economy, and society surrounding it. Rural areas have an irreplaceable economic, social, cultural and ecological importance (Perlín–Simciková 2008). The concept that the functions of rural territories serve not only the trade of the suburbs, agricultural or touristic aims was first mentioned in a regional development document (EC 1999) more than one and a half decade ago. This statement is even more relevant nowadays, as most of the cultural and biological diversity of the European Union is to be attributed to these territories.

Researching rural areas has several actualities these days. According to Buday-Sántha (2004, p. 32) *“...in the new millennium we cannot find a place for the countryside as a fundamentally agricultural territory in the spatial sciences and there is a tendency to look at it in terms of rural development policy, as a separate entity uprooted from the space as a whole, which is absurd and brings us nowhere”*.

The global and comprehensive urbanisation characteristic of the twentieth century and the present as well, which is transforming economic, social as well as settlement processes, includes two typical and distinct units of configuration, the urban and rural areas (Csatári 2001). The countryside has mainly been the endurer of the aforementioned urbanisational processes (Csatári 2000).

Over the past decades rural areas have undergone significant changes all across Europe. The European rural areas are becoming more and more diverse, in addition, they do not only change in space and time but they differ in diversity, mobility, identity, and their resources as well. Moreover, their features of globalisation are also different (Szörényiné Kukorelli 2005). That is, as the author adds, the whole of Europe is characterised by constantly changing and highly differentiating rural areas with new functions.

In the case of Hungary the regime change was a momentous event with significant effects even up to now. Several social and economic changes took place with severe impacts on the countryside, like the urban-rural dichotomy of settlements forming a social gap until the recent past (Enyedi 2011).

A major change like that is bound to have serious impacts. Buday-Sántha (2010) reveals that polarisation striking the whole of the countryside was prevailing in the two decades following the change of the regime, in the period of which the negative economic and social processes became more dominant. By the windup of large-scale farms and rural industry the

countryside lost its economic base together with the local intellectuals, who represented an organising force with an economic background and would have been able to implement developments adjusting to local features.

Speaking about the countryside we have to mention the role of agriculture, which has had an upset due to the prompt transition after the change of the regime (Benet 2006). Buday-Sántha (2010) claims that development can only be seen in the regions which were able to integrate into urban economies, however, it failed to happen in the major part of the countryside. The dynamizing effect of development sources mostly appears in the moderation of infrastructural shortcomings but with no significant economic impact.

According to Dinya (2011) every region is threatened by social, economic, and ecological tensions to various degrees due to their different situation and the less favoured peripheral areas are especially endangered.

Despite the fact that rural areas in East-Central Europe struggle with many difficulties, in a wider context of the countryside we can talk about numerous changes. In the past few decades the theory of endogenous development came to the front in spatial development and regional policy and this approach gained relevance in a rural context as well. In the case of the countryside the emphases are slightly different though.

The socio-economic analysis of territorial differences has always been in the focus of attention in Hungary (Nemes Nagy 2003, Obádovics 2004). Also, in the discourse of urban-rural relations in regional science, researching rural areas and creating their development plans are no new phenomena either (Csatári 2000). Nevertheless, the empirical analyses of the so popular theory of endogenous development, including the probably most popular concept of territorial capital have the cities or the territorial units on a certain hierarchical level in their focus, e. g. the subregions of Hungary, or NUTS 2 regions of Italy. These analyses neglect the countryside or they lay minimal focus on them.

## **2. Academic literature**

In my dissertation I analyse the development of Hungarian rural subregions. The background of my thesis is based on the holistic approach of the concept of the countryside and the academic literature of endogenous regional development. There are many different approaches to the theory itself. Thus, we can see differences as well as similarities between the key factors of the theory. I intend to synthetize all these capitals to create a conceptual framework which could serve as a basis for quantitative analyses.

## 2.1. Concept of the countryside

The difficulty of defining the countryside is revealed by the phenomenon that it does not only have one widely accepted concept to this day, even though rural areas are a major scientific topic in many countries (EC 2011).

Kovács (1998) claims that since the topic of regional development got into the focus of attention in Hungary ‘the countryside’ has been a much-used notion with several alternative interpretations. The situation has not improved since then as it is not even clarified what percentage of people live in rural areas.

Many other papers deal with the question above and will probably do so in the future as well, which might be called evident as the creation of a widely accepted concept is set back by different points of view, the spatial changes affecting the countryside, and the differences of the system of relations (G. Fekete 2013). In my study I try to highlight the various conceptual and practical approaches to the theory.

*My aim is to review these approaches, and not to find the most complex and best one. Therefore, I do not make an attempt to create an optimal, generally adaptable method during the territorial delimitation either, which, according to me, would probably be inherently impossible.*

To take a short international review I would like to mention the widespread definition of the European Charter of Rural Areas (EC 1996/a). Essentially it describes the countryside as a stretch of inland or coastal countryside, including villages and small cities, which compose a socially and economically organic territory together with the surrounding rural areas of lower population density, where the area is mainly used for agriculture, forestry, environmental protection, and recreation.

Furthermore, the definition of the countryside can be approached by its attributes, like the size of the settlement, its functions, and the built environment. However, as it is less ambiguous to define ‘the urban’, in many cases the village is mentioned as a non-city settlement, while ‘rural’ entails the notion of non-urban (Csatári 2001).

Romány (1998, p. 49) also interprets the countryside in terms of its relation to the city: *“...it is the cities which have countryside. Namely, cities which provide something for their surroundings, that is, the countryside, and which the rural area exchanges goods with. (...) That is, the countryside has an urban area, where it can satisfy certain needs and pursue intellectual and material exchange of goods. Also, the city has a rural area, where people are familiar with it and where it can feel cozy”.*

Or as Rechnitzer és Smahó (2011, p. 104) define “...*the countryside is a space constituted by town and village, which is situated far from the city. It has a loose settlement pattern and represents a lifestyle and values different from those of the city*”.

## **2.2. The theory of endogenous development**

“*The concept of development, according to its most general interpretation, means the process which leads from a lower standard to a higher one*” (Szentes 2011, p. 13). Szentes (2011) highlights that the theory of development had diverse interpretations in the past few centuries, mostly in the recent past, depending on the branch of social science in question. The definitional problem is also mentioned by Todaro and Smith (2009), who claim that without a certain level of agreement neither quantitative analyses can be carried out nor can it be determined, which country develops. The authors add that the strict economic definition traditionally means long-term income per capita growth, which enables a faster output than the population growth for a nation.

It is important to mention that I agree with the general view that growth is a quantitative change, while development is a qualitative one. In economics development means economic development (Farkas 2002). But even considering the aforementioned strict definition we have to highlight Lengyel’s opinion (2012/a), who explains that economic development is a wider concept than economic growth, as it has influence not only on fundamental economic indicators but other factors outside the economy as well.

If we investigate the territorial aspect of development, talking about any kind of development the aim must be the creation or forming of a successful region. By the theory of success, Enyedi’s view (1998, pp. 409–411.) is highly relevant, who does not only pay attention to the criteria of competitiveness but to the aspects of the sustainability of natural resources and social justice as well: “...*in a successful region the income is increasing. A notable part of this income is utilised in the region as investment, entrepreneurial or household income or as tax which can improve the given settlement. The growth of income appears in wide classes of society, it does not harm the natural, built and cultural environment. Finally, the growth involves all settlements of the region and it does not raise territorial differences*”. Analysing the question of successful territory in a rural context Glatz (2010, p. 7) mentions that the fundamentals of success are favourable geographical location regarding traffic conditions, proximity to the labour market and the market in the first place, followed by natural and local resources. He adds: “*more and more it seems that the secret of success is mainly dependant on*

*the human artifice, inventiveness, sedulity, and cooperation. That is, local rural development is dependent on the presence of active inhabitants as well as the recognition and utilization of local facilities”.*

Today endogenous development is a highly valued branch of development theory. Concerning the notion itself Lengyel says “...*endogenous, in economics, means the factors which are not inherited (“not born of God”) but created consciously by economic activities. In regional science the bottom-up organised public actions and initiatives, which are based on consciously created local facilities are regarded as endogenous”* (Lengyel 2012/b, p. 145).

According to Benko (1997) endogenous development appeared in the late '80s, though in fact the author mentions industrial and urban regions in his study. Stimson et al. (2011) claim that in the past decades we can see a kind of shift from exogenous facilities to endogenous ones. In accordance with that, Lengyel (2012/a) also states that the endogenous factors have recently come to the front in regional development.

In Roberta Capello's view (2007, 2011) endogenous development depends on a regions' constitution, which is a socio-economic and cultural system defining the success of local economy via the elements of entrepreneurial skills, local factors of production (labour and capital), contact management of local actors, which increasingly contribute to the creation of knowledge.

Capello (2007, 2011) says that decision-making capacity is also an important condition of endogenous development, which enables the local economic and social actors to control and support the development processes when change and innovation are underway.

These conditions are important as several even statistically significant territorial differences are not to be attributed to the inefficient usage of the classical factors of production, such as capital and labour but are the result of deeper rooted regional problems, e.g. local geographical facilities, openness, creativity, entrepreneurial milieu (Capello et al. 2009). Capello and Nijkamp (2011) mention social opportunities, healthy environment, and high-quality education as factors determining the regional aspect of economic development.

Within endogenous development there is an inherently strong link between theory and practice. Concerning the latter, Rehnitz (1993) says that the circumstances of world economy changed in the 1970s and adds that “...*many industrial states saw the new regional development strategy of multiple relations in the opportunities within the region, i.e. in the utilization of facilities and the renewal and development of local forces”*. Lados (2001) insists that endogenous resources can be activated in case of appropriate conditions. It is not a coincidence that the concept is used in both developed and developing countries (Tödtling 2009).

Capello (2007, 2011) proposes that endogenous development has two major branches. One is the neo-Marshallian approach, which regards local growth as the effect of externalities' role on firms. The other branch is the neo-Schumpeterian literature, which has come to the front recently claiming that development results from the impact of local externalities on the innovative capacities of firms.

The utilization of local facilities is sometimes ambiguous, which can cause significant disadvantages. The appreciation of undercover facilities mentioned above highlights the real trouble of the devaluated Hungarian countryside.

Capello et al. (2009) think it is obvious that at least two conditions are essential. The first one is local production and the appropriate utilization of knowledge. The other one is the territorial capital, which respects the specialities of the given region.

Referring to territorial capital, Reznitzer (1993) highlights the different interpretations of regional potential and he mentions the elements constituting it (Reznitzer 1993, p. 155):

- “potential of capital (available production base or asset),
- labor force skills,
- quality of infrastructure,
- geographical location,
- environmental conditions,
- market connections (factors of demand),
- socio-cultural facilities,
- decision-making, institutional structure and power relations”.

According to Capello's approach (2007) the main cause of territorial differences is the unequal distribution of innovative activities. As we can see, while capital and labour moves easily in our time, the most immobile factors are the immaterial ones linked to innovative capacity.

Dinya (2006) also emphasises that the formerly decisive material factors (e. g. land, capital, labour) are overshadowed and soft elements (corporate culture, corporate knowledge, information) have come to the front.

### 3. Aim of research and hypotheses

*The aim of my research is to give a comprehensive introduction of the territorial differences of Hungarian rural subregions in terms of their material and immaterial capital accumulation. In my study I intend to set up my own measuring system and a model revealing the relations of endogenous capital factors in the framework of a descriptive analysis relying on the theory of endogenous development.*

I investigate the different aspects of rural territories in space and time. Territorial differences which evolve by the different but equally important capitals raise many questions. The hypotheses of my dissertation are also linked to these.

We have to consider how each territorial unit can be measured. On the one hand, I review the academic literature and models of the topic, on the other hand, I survey the accessible bunch of data which can be used in my analysis. My first hypothesis reflects to this dual 'need'.

**Hypothesis 1:** *After making a complex dataset or framework, which is able to measure the socio-economic processes of territorial units on the same hierarchical level, I presuppose that the investigated territorial units, the subregions can be differentiated and grouped according to the aggregation of capital factors reflecting their development.*

Moreover, if we are able to measure the development or underdevelopment, the question of which the most important capitals in a successful area are crops up. With my second hypothesis I try to give an answer to this question.

**Hypothesis 2:** *The development of an area is based on several criteria. Economically developed territories do not have an outstanding position on every ranking list either. But as I assume, there is no region with highly developed economy which has moderate human resources.*

Furthermore I consider to investigate generally (so, handle material and immaterial capitals separated) that development how links to the level of rurality and to location.

**Hypothesis 3:** *I also assume that the development of territorial units regarding the accumulation of material and immaterial capitals is related to their location and level of rurality.*

To prove my fourth hypothesis it is essential to use regression analysis. In hope of verification I add to my theory that in the forthcoming model there are positive links amongst the factors only.

**Hypothesis 4:** *I presuppose that all the relevant material and immaterial capitals can be involved in a path analysis, which can reveal the links between the elements and these links are positive.*

Moreover, in my opinion it is important to analyse my model in a dynamic way, investigating the changes of mechanisms in time. On the other hand, it is also significant to test my model in an urban context.

**Hypothesis 5:** *In my opinion the relations of capitals can differ in time and space (considering the strength or even the existence of the connection).*

At the end of my work I try to summarise my remarks taking the analysed framework into consideration. Is it a fashionable concept only or can it bring practical benefits to regional policy? I hope that my study can contribute to a deeper understanding of the socio-economic processes of rural space and my results can offer a useful addition to Hungarian and international literature on the topic.

#### **4. Structure of the dissertation and research methodology**

In the first part of the dissertation I review the academic literature and the major processes of rural areas. First of all, I define the theoretical background of the countryside and I highlight the remarkable and sometimes significantly different approaches. Then I explore the possibilities of delimitation in rural areas. Furthermore, I examine the processes and challenges of the countryside including rural policy as well.

In the second chapter I look into the theory of endogenous development, which I assume to be a qualitative change. Despite the fact that in this case it is very difficult to carry out quantitative analyses, according to me, they have obvious relevancy in regional and rural researches. Besides defining endogenous development in my dissertation, I compare several models and capitals. The comparison shows the most important elements by the usage of which the development of rural subregions becomes measurable.

Considering the methodology of the research, I try to answer my research questions based on the latest statistical indicators, i.e. the TeIR database.

After the delimitation 106 subregions of the Central Statistical Office are considered rural, thus they serve as the framework of my quantitative analysis. The methodology of the empirical test can be found in the first part of chapter three, four, five, and six. The territorial units are compared to the multivariate analyses. I investigate the accumulation of material and immaterial capital accumulation by principal component analysis and cluster analysis as well.

Then I use PLS path analysis to highlight the effects of capitals to each other. Finally, I summarise my results and I make a conclusion through proving or rejecting my hypotheses.

## 5. Results of dissertation

Regarding my goals and hypotheses I can state the results of the dissertation hereunder:

**Thesis 1.:** *After setting up a complex set of indicators, each subregions can be differentiated and grouped by their development regarding any forms of capitals.*

After the factor analysis, there is an obvious hierarchy amongst examined subregions in case of all capitals. So, because the expression I mapped the territorial units in groups, but the all the differences can be seen (Appendix 4). Those smaller volume differences may be appreciated in a possibly practical usage of the results.

**Thesis 2.:** *Regarding to the economic indicators (fixed capital) successful territorial units have good positions in every ranking neither, but we can state there is no economically advanced area which has poor figures in social capital.*

Link between fixed capital and social capital can be seen in figures (figure 33 and 37) as well, and I exposed tables (table 33 and Appendix 8) with correlation between the two capitals. Furthermore PLS path analysis is used to determine the moderate-strong positive connection between the capitals. In the model, social capitals' direct effect in the first two years (2009: -0,611; 2011: -0,647) is moderate-strong and in 2013 it is moderate (-0,534).

**Thesis 3.:** *We can state that geographical location has a great importance regarding development. At the same time there is no provable link between the level of rurality and the material or immaterial development of the investigated territorial units.*

Regarding to cluster analysis we can clearly allocate the location of well developed subregions. Those have a high concentration in the northern Transdanubia and close to Budapest. So, with a crosstab analysis I investigated the connection between location and development and it is proven that it exists and has a moderate strength.

I also used crosstab analysis to prove the link between material or immaterial development and the level of rurality. But there is no proven connection between the elements. Thus, I could not verify that subregions with lower level of rurality are more developed.

**Thesis 4.:** *All the capitals which is thought to be relevant by literature cannot be involved to that regression model which helps to reveal and to understand to connections of capitals. At the same time, between the capitals which can be involved there is an obvious positive link.*

In my view, based on academic literature, all the seven selected capitals are relevant. Regarding to PLS test data all can be involved to the model, but the environmental capital has not got significant connection with any other capitals. So it is not an integrated part of the model. But do not forget the earlier mentioned barriers referring to data collecting phase which can cause problems in case of hardly quantifiable indicators.

So the analyses of connections of capitals is being interpreted the other seven capitals. There are differences in those effects but none of them have negative impact to fixed capital, in any time.

**Thesis 5.:** *My model can be applied in rural context, inherently. Furthermore, we can state that relations between the capitals are notably different in variant times.*

As I presented in 2009 and 2011 the same ways were significant within PLS path analysis. But in 2013 it is slightly changed. One way “disappears”, the “appears” in the system. Moreover, there are differences in the strength of ways but those are not remarkable.

My model was tested in urban context, but because the poor test results we can state the model is not able to be used in that atmosphere.

It can be said endogenous development is a so popular theory nowadays, which has a higher relevance in regional policy. However, there is a limited amount of empirical researches in the topic, especially in Hungary. So in my opinion the aforementioned theory has relevancy to apply it within rural environment.

In the dissertation I tried to answer several questions, but during the work new ones have appeared. In my view the approach based on endogenous development has relevancy in regional development, and it appreciates in countryside. As we saw in case of subregions some kind of capitals has not only poor level in rural areas, but those are almost lacking. This generates further questions for regional policy, but to reveal the specialities of underdevelopment is moving forward the prospect of development definitely.

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