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SUB-REGIONAL FEATURES OF THE TERRITORIAL CAPITAL

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## 1. Introduction

The conception of the territorial capital emerged in the terminology of modern regional sciences about ten years ago. It has not found a generally accepted definition yet, so I can meet only attempts at its definition. To find a commonly accepted definition is made even more complicated by the fact that the different conceptual models use several capital elements. Of course, there are overlaps, analogies among the models but I can often find differences as well. The introduction of the category of territorial capital is important because earlier investigations have only examined the tangible assets and the variables that can be easily measured in economic terms. However, the territorial capital is a new, complex concept through which it is possible to examine the deeper relationship system of the regional economic structure; it can help determine the attractiveness of a give spatial structure (ENYEDI 1990). The material (financial capital, produced capital, etc.) and intangible (local milieu, territorial mentality, local trust, relational network, culture, integration among bottom-up types of clusters, attitudes, traditions, regional habit, territorial identity, etc.) capital elements can be measured and analysed by a new term, it is concept of territorial capital.

The aim of my doctoral dissertation is to collect the theoretical backgrounds and approaches of the concept of territorial capital, then, integrating these, all of it is interpreted and classified in logical framework. After the theoretical chapter, I present the methodological system of my empirical survey and its results. The dissertation looks for answer the following questions:

- what was the distribution of seven components of the territorial capital among the Hungarian subregions from 2004 till 2010,
- how the value of territorial capital was fluctuating at macro- and subregional level from 2004 to 2010,
- what were the annual average rate of growth of the subregions with the highest and lowest territorial capital,
- which component of capitals were determining the territorial capital, which is a composite index, from 2004 till 2010.

In the first part, Review of Technical Literature, I present the regional development theories then, using neoclassical endogenous growth theory, I demonstrate the conceptual segments, classification, models and definitions experiments of paradigm of territorial capital. In the theoretical part, in addition, I elaborate, as well, the Keynesian, neoclassical exogenous and endogenous regional growth theories and the territorial approach in

chronological order. Shortly, I design the literature on concept of territorial capital.

I emphasise, the researchers are getting more and more less use the MASST model in the international empirical investigations, nevertheless I designed it because I adopted it of some methodological steps. I examine the functions, innovation possibilities, major characteristics and the features of its methodical process (MASST model: MAcroeconomic, Sectoral, Social and Territorial). After this, I present conceptual models of territorial capital as presented by the OECD (2001), Balázs István Tóth (2010a, 2010b) and Roberto Camagni (2009b). Then I demonstrate the methodological structure and results of international surveys that based on paradigm of territorial capital. A total of 16 such studies were demonstrated, only be deal with, which based on directly concept of territorial capital. It should be noted that all empirical study is based on the definition Camagni's model, it proves that it is not only theoretically but also empirically tested, this paradigm is correct beyond practical research field.

The second unit of my doctoral dissertation is the Materials and Method, in which I present longitudinal measurement method of paradigm of territorial capital. This chapter is divided is three parts: (1) creating the database, (2) process of index creation, (3) presentation of the procedures used in the analysis. First, the missing data are estimated then I apply Q-type Principal Component Analysis to filter the multicollinearity among variables and to reduce the number of variables at statistically acceptable level. As a result, I have created a database of 62.118 cells, it has giving you my raw, primary data.

During the index creation my database is normalised so-called min-max methods for research of concept of territorial capital, creating with the same projection basis. As the territorial potentials mutually define each other, I apply a new novel its called penalty for bottleneck (PFB) to clarify and correct my database. This is necessary because the value of territorial capital is not same as the average of types of capital, but also have to take into account the interaction among local potentials. The method of penalty for bottleneck is appropriate to do so. Nobody has applied this novel way in survey of concept of territorial capital so far.

Methodological recommendations for my database into two parts: I compare 5 years before crisis (2004-2008) during the crisis period (2009-2010) for 2 years. I apply the conventional statistical methods for the growth rate of the territorial capital of operationalisation, before and during crisis, growth performance is measured first order differential calculation.

The third unit is the Result chapter, in which I summarise my new and very novel research results. I show that at macro-level the assets of territorial capital were increasing five years before economic depression, the its average growth was 0,53%. The first two years of crisis the average growth rate of the territorial capital was 0,89%, a 0,36 percentage point improvement. At Hungarian subregional level (it is the LAU1 – Local Administrative Units<sup>1</sup>) the growth of territorial capital was not stopping under the 2 years of economic depression, but marginally increased. In the first year of the economic crisis (2009), the territorial capital is relatively greatly went down, this was followed by a slightly correction in 2010. Comparing the rate of growth of territorial capital before and during economic crisis, it turns out that the Hungarian subregions rate of accumulate of territorial capital fluctuated. The assets of territorial capital of Hungarian subregions were dynamic growing (it was a small decline in 2005 and it was stagnation in 2009) between 2004 and 2010. The highest rate of growth was between 2005 and 2006.

My result shows that average rate of growth of the 20 subregions with highest endowment of territorial capital were so high than the average rate of growth 20 subregions with lowest endowment of territorial capital. The average rate of growth of the 20 subregions with highest endowment of territorial capital were 4,83%, but the average rate of decrease of the 20 subregions with lowest endowment of territorial capital were 4,57%. There is difference between 9,58 percentage points. Finally, there was no convergence between conglomerates between 2004 and 2010. Finally, I examine the reasons that determined the components of territorial capital, thus I have opportunity, in addition, to show the trends and backgrounds factors of territorial capital.

### 3. Matters and methods

Following the earlier international surveys, I apply the Camagni-model it provides theoretical background for my framework of empirical investigation. I distinguish the territorial capital seven elements (economic capital, infrastructural capital, institutional capital, human capital, social capital, relational capital, cultural capital), their indicators are collected from the National Development and Planning Information System.

First, the missing data are estimated then I apply Q-type a priori Principal Component Analysis to filter the multicollinearity among variables and to reduce the number of variables at statistically acceptable level. Only those indicators held at the end of which the KMO criterion value (Kaiser-Meyer-Olkin) and the MSA (Kaiser-Meyer-Olkin) value was 0.5 over all years. The comodain of MSA is between 0 and 1 it means that given variable which is closely related to other variables (SAJTOS-MITEV, 2007 270.p.). Variables with a communality value below 0.3 were eliminated from the study, for the seven-factor test model of the maximum-likelihood method showed a reasonable fit all year; the avearge value of varince is 79,28% (more detailed information see 1 table).

| <b>Year</b>  | <b>Number of principal components</b> | <b>KMO</b> | <b>Level of significance</b> | <b>Variance ratio</b> |
|--------------|---------------------------------------|------------|------------------------------|-----------------------|
| <b>2004</b>  | 7                                     | 0,711      | 0,000                        | 71,452%               |
| <b>2005</b>  | 7                                     | 0,763      | 0,000                        | 82,579%               |
| <b>2006</b>  | 7                                     | 0,757      | 0,000                        | 78,418%               |
| <b>2007</b>  | 7                                     | 0,801      | 0,000                        | 84,618%               |
| <b>2008</b>  | 7                                     | 0,812      | 0,000                        | 78,285%               |
| <b>2009</b>  | 7                                     | 0,809      | 0,000                        | 79,316%               |
| <b>2010</b>  | 7                                     | 0,825      | 0,000                        | 80,349%               |
| <b>Átlag</b> | 7                                     | 0,782      | 0,000                        | 79,288%               |

**Table 1. A principal component analysis of applicability of the key data**

*Source: own edition 2012.*

Determined the number of variables in the principal component analysis, this is a commonly accepted method in the survey of territorial capital (CAPELLO-FRATESI, 2013; CASI-RESMINI, 2012; CARAGLUI-NIJKAMP, 2008a; TÓTH B. I., 2011a). Camagni emphasise that seven capital elements are in the territorial capital model (economic capital, infrastructural capital, institutional capital, human capital, social capital,

relational capital, cultural capital), I used these as well (BRASIL-SAGUATTI-BENNI-MARCHESE et.al. BRASIL-SAGUATTI-BENNI-MARCHESE és mtasi, 2012, 2012, CAMAGNI-DOTTI, 2010). Aggregating these components, I can get the value of territorial capital.

Finally, I created a matrix of 62.118 (51x174x7) cells by the a priori principal component analysis. It means that 51 subindex are classified into 7 index, these are aggregated can be the value of territorial capital.

After this, I normalised the variables. As the territorial potentials interact each other, I have to take into account it in the measurement. To I applied the method of penalty for bottleneck. It is novel way, very new methodological process, nobody has applied it so far in the survey of territorial capital, I used this for the first time in this constellation. Practical application of the method is simple. First step, the standardized indicators by size of queue (RAPPAISZERB, 2011 5.p.):

$$0 \leq X_1 \leq X_2 \leq \dots \leq X_k \leq 1$$

Then all indicators can extract from the smallest value of indicator and I add 1 to this number, then take the logarithm of this (BAJMÓCY, 2012 21.p.), that is:

$$K_i = \ln[1 + (A_i - \min_a)]$$

where: “K”: correction factor, “A”: corrected index, the “min”: This represents the minimum value subregion. After this, I obtain the value of corrected that normalised value is extracted from the correction factor, namely:

$$A_i^x = A_i - K_i$$

Final step, all variables are adjusted by the number of sub-indexes, then I obtain the corrigated of value of territorial capital, this value is again between 0 and 1 (BAJMÓCY, 2012 21.p.):

$$\ddot{O}I_{tc} = \frac{\sum_{i=1}^n A_i^x}{n}$$

The penalty function is correct, if the average of the values are not changed more than the original, without penalty function value namely (RAPPAISZERB, 2011 6.p.):

$$kx_1 + \sum_{i=1}^k f(x_i - x_1) \leq \sum_{i=1}^k x_i$$

$$x_1 + \frac{1}{k} \sum_{i=1}^k f(x_i - x_1) < \frac{1}{k} \sum_{i=1}^k x_i$$

Methodological recommendations for my database into two parts: I compare 5 years before crisis (2004-2008) during the crisis period (2009-2010) for 2 years. I apply the conventional statistical methods for the growth rate of the territorial capital of operationalisation, before and during crisis, growth performance is measured first order differential calculation.



## **3.Results**

My doctoral dissertation has empirical and theoretical results. Firstly I present the theoretical part. I summarise here the approach and models of concept of territorial capital.

### **3.1. Theoretical results**

#### *3.1.1. The model of OECD*

The territorial capital concept was first defined and applied in the report of the OECD (2001) titled Territorial Outlook. Though it was an immature definition, it can also be used well nowadays it is proven to be abiding. It has given such a complex meaning to this concept system whose concept elements are built on each other and we can experience overlaps in meaning.

The OECD (2001) differentiates three kinds of capital types in its territorial capital taxonomy: tangible factors, untraded interdependences and intangible factors. From the chart we can see that the geographical and economic factors belong to the tangible factors, the untraded interdependencies includes the unwritten tradition and milieu while we can list to the intangible assets the written laws and the institution system thought to be legal interregionally. It is clear from the above mentioned that the OECD differentiates three segments of the concept of the territorial capital the tangible factors, untraded interdependences and intangible factors. These three categories cannot be separated from each other, they can be separated only on a theoretical level, and in reality they mutually determine each other. The sum and combination of these three parts (beside the natural and territorial factors, the material and intangible capital associated to the members of the local society and the economic characters of the regions) give the value of the territorial capital. The OECD throughout emphasizes the social and cultural (historical) background conditions of the endogen development in its territorial capital concept. (OECD 2001: 15-16) These contribute mutually to the development of the competitiveness and the general regional development.

| <b>Tangible factors</b>  | <b>Untraded interdependencies</b>   | <b>Intangible factors</b>   |
|--|---|---|
| geographical location, size, factor of production endowment, climate, traditions, natural resources, quality of life or the agglomeration economies provided by its cities, but may also include its business incubators and industrial districts or other business networks that reduce transaction costs | understandings, customs and informal rules that enable economic actors to work together under conditions of uncertainty, or the solidarity, mutual assistance and co-opting of ideas that often develop in clusters of small and medium-sized enterprises working in the same sector (social capital) | the outcome of a combination of institutions, rules, practices, producers, researchers and policy-makers, that make a certain creativity and innovation possible. |

**Table 1. Sources of territorial capital of the OECD**

*Source: Own edition based on OECD 2001: 15-27.*

The evolvement of the clusters had a significant function in the accumulation of the material goods (OECD 2001: 18), because the territorial advantages were strengthened with this and it determines the social processes as well with its multiplier function. It points out that it is necessary to develop the capital elements connecting to the satisfaction of the needs of the solvent demand. If it is not available, it will be necessary to develop new capital elements to this. In other words the territorial capital shows the resources of the tangible and intangible competitive advantages and disadvantages of the region.

### *3.1.2. Balázs István Tóth's model*

Tóth differentiates the tangible and intangible segments of the territorial capital. According to him the tangible capital assets include the produced capital, the financial capital, and the investment capital. The operationalization of these can be made easily by the gross domestic product. According to Tóth the following can be listed to the conceptual elements of the intangible assets:

#### Intellectual capital

The Swedish research center, the Skandia (1995) began to use this capital type again in one of its reports, which meant the renaissance of this category in the sciences of society. The measuring method of the intellectual capital was explained by the Swedish Ricarda project.

### Human capital

According to the document of the OECD connecting to the territorial capital the human capital has to be defined as all the abilities, skills, knowledge and competency which make the individual capable of establishing and increasing his welfare. According to a later document the human capital “means the treasury of abilities that was maintained and developed with the help of educational training or practice and it also means such knowledge which expands the labour force supply.” (OECD 2003: 25) In other words such intangible assets can be listed here that can be obtained in the formal and informal socializing processes and its results appear in the structure of the labour force market. According to Bourdieu (2004: 123-125) to measure the profit ratio and the fiscal and economic return of the educational investment is the task of the human capital.

### Psychic capital

Markman’s (2007) study analyzes the functions of the psychic capital. During the acquirement of the human capital not only lexical knowledge can be obtained but can be acquire such attitude, behaviour and emotion which make the individual capable of accumulating higher incomes (learning written and unwritten norms, knowledge of protocol etc.)

### Creativity capital

The creativity capital connects to the human and psychic capital in an organic way. While learning the individual accumulates knowledge, which gives creative and innovative ideas and this is essential in the case of regional economy development.

### Knowledge capital

Stehr (2002) introduced this terminology in the system of the regional economics. This capital element fits to the above mentioned ones to the extent that it is necessary in the case of knowledge based economy in the work needing higher qualification. In the underdeveloped economies it is less needed.

### Organizational capital

The organizational and the relational capital are also called structural capital. (Skandia 1995, Sveiby 1997). The category of the organizational capital appeared for the first time in Tomer’s (1987) study which can be interpersonal and not connected to individual (inter organizational). Its

tangible and intangible components can be highlighted “for example the basic and applied research, the results of the development, the value of the equipments developed by themselves, the valuable, introduced brand name – and infrastructural equipments – moreover the philosophy of management, the culture of the organization, formal and informal communication systems, relations, networks of investors, financial institutions and others.” (Tóth 2010: 69) The organizational capital can be accumulated and reproduced by organization development, whose precondition is to have human capital. The accumulation of the organizational capital depends on the human capital.

### Relation capital

According to the Skandia group the relation capital appears both in the individual and in the collective interdependency. In the territorial capital concept both relation system play important roles. Some say that the interpersonal capital assets cannot be listed here, only the relations independent from the individuals (clusters, networks, R&D, institutional system, etc.). (Tóth 2010: 69-70) “According to the definition of Capello and Faggiani (2005) and Camagni (2008) we consider the cooperation as relation capital between the economic characters even the knowledge transfer and the change of experience not only on the level of companies but also on the level of countries and regions, cities.” (Tóth 2010: 70) Relation capital can be obtained only from the actually available relation structure.

### Cultural capital

The meaning of the category of the cultural capital is connected to the work of Bourdieu (2004) in the regional science. The reason why this category is more and more important is that knowledge, in a wider extent the culture, as an intangible capital element, can be converted into economic capital. We can highlight three types of the cultural capital: the cultural capital being in the (1) incorporated form, (2) objective form and in the (3) institutionalized form. We can list among the incorporated assets the emotions, attitudes, behaviour, mentality and habit that we acquire at home by learning through formal and informal socializing mechanisms. During the reproduction strategies the acquirement of the non-lexical knowledge and skills happen in this field. Only the affected individual can be responsible, other individual cannot be involved into it. The competencies acquired this way become the property of the individual with the help of which he can transform his available resources into other capitals. It is typical that the more incorporated cultural capital is available the higher extent it can be transformed into other capital. To measure the incorporated assets the time is used that is needed to acquire the assets, which can be several years, even decades.

The convert of the objectified cultural capital is easier and faster than the previous one. The process of the accumulation of this is foregone by the existence of the incorporated capital and it depends on the other. It is easy to measure; this capital type is usually manifested in the possession of books, lexicons, paintings, works of art, valuable artistic works. We have to take into account that through inheritance or disposition inter vivos only the devolution of ownership occurs, the transmission of the knowledge and competency does not occur in every case.

The cultural capital element has a major role in the evolution of the territorial processes and in the regional growth; the cultural capital significantly determines the economic expectations of a territory. (Radvánszky-Sütő 2011) The society of the territory has accumulated a kind of special tacit knowledge by their tradition, local history and relation system that has become the organic part of the territorial capital.

The institutionalized cultural capital element is objectified in academic compellation and symbols. Science is unequivocally creating levels and hierarchy and in the life of university it means the recognition of competencies. It can be measured in the tertiary institutions and the research institutes of the certain region by the number of people having academic grade. It is worth considering those academic grades which assumes about the instructor that he will pass over marketable knowledge in the region. (Polónyi-Tímár 2001).

### Social capital

In the regional science the social capital means social integration which is one of the conditions of the economic development. According to Bourdieu (2004) the social integration measures the success of the individual's integration and the individual's belongingness to the society; the belongingness to the group in itself makes profit. "The social capital is the aggregate of the actual and potential resources which belong to the ownership of the constant network of the institutionalized relation based on mutual acquaintance and recognition or in other words they are such resources that are based on the belongingness to a group." (Bourdieu 2004: 130) The social capital embraces only those social relation systems which can be mobilize on the economic, psychic, social, etc. behalf of the individual. It depends how much and what kind of capital types the mobilizable people have already collected. We have to highlight that the individual's relation net usually include those layers where he comes from. In other words those having higher and more capital elements for the solution of their problems can mobilize easier such people who also accumulated several kinds of capital

types – and it is true vice versa which generates and reproduces regional inequality. The social capital does not evolve by itself; it has to be created artificially and has to be maintained to make profit.

Significant relationship can be pointed out between the space structure and the social capital, the social capital belongs to a territory. The social events and activities are connected to a space where the capital conversion and the accumulation can happen. The maintenance of the relation is a conscious activity which needs time and financial expenditure.

The belongingness to certain formal or informal groups means capital in itself directly or indirectly. At the evolvement of the clusters the relation net is widened by the mechanism of join with which even profit can be reached.

### **CAMAGNI's definition model**

Camagni (2008, 2009) in the classification of the factors of the territorial capital highlights not only two factors (material and intangible) but determines three components (material, mixed goods and intangible). By this we get a more accurate meaning of the territorial capital. He defines the nine elements of the territorial capital on the basis of the manifestation of the competition and the different goods.

|                |  |   |   |   |
|----------------|--|---|---|---|
| <b>Rivalry</b> | <p><b>High rivalry</b><br/>(private goods)</p>     | <p><u>Private fixed capital stock</u><br/><u>Pecuniary externalities (hard)</u><br/><br/><u>Toll goods (excludab.)</u><br/><br/>c</p>             | <p><u>Relational private services operating on:</u><br/>- external linkages for firms<br/><br/>- transfer of R&amp;D results<br/><br/><u>University spin-offs</u><br/><br/>i</p>                          | <p><u>Human capital:</u><br/>- entrepreneurship<br/><br/>-creativity<br/><br/>-private know -how<br/><u>Pecuniary externalities (soft)</u><br/>f</p>                |
|                | <p>(club goods)<br/><br/>(impure public goods)</p> | <p><u>Proprietary networks</u><br/><br/><u>Collective goods:</u><br/>- landscape<br/><br/>- cultural heritage<br/>(private "ensembles")<br/>b</p> | <p><u>Cooperation networks:</u><br/><br/>- strategic alliances in R&amp;D and knowledge<br/><br/>-p/p partnerships in services and schemes<br/><u>Governance on land and cultural resources</u><br/>h</p> | <p><u>Relational capital:</u><br/><br/>-associationism<br/>- cooperation capability<br/><br/>- collective action capability<br/>- collective competencies<br/>e</p> |
|                | <p>(public goods)<br/><br/><b>Low rivalry</b></p>  | <p><u>Sources:</u><br/>- natural<br/>- cultural<br/><br/><u>Social overhead capital</u><br/>- infrastructure<br/><br/>a</p>                       | <p><u>Agencies for R&amp;D transcoding</u><br/><br/><u>Receptivity enhancing tools</u><br/><u>Connectivity</u><br/><u>Agglomeration and district economies</u><br/>g</p>                                  | <p><u>Social capital (civicness):</u><br/><br/>- institutions<br/>- behavioural models, values<br/>- trust, reputation<br/>d</p>                                    |
|                | <p><b>Tangible goods</b><br/>(hard)</p>            | <p><b>Mixed goods</b><br/>(hard + soft)</p>   | <p><b>Intangible goods</b><br/>(soft)</p>   |   |

**Table 2. A theoretical taxonomy of the components of territorial capital**

*Source: Camagni 2009: 123*

In the taxonomy of the territorial capital the following things have significant meaning: financial resources, local engineering infrastructure, human resources, marketable knowledge that can be found locally and can be

developed, the relation network, the inheritance of objects and history which determines the identity of the territory.

### Public goods and resources

According to Camagni the material capital and the infrastructure found in the territory can be listed to this category. They are the fundament of the attraction of the economic territory. The advantage of this can be distorted by the increase of the farming lease, the amortization, and the unsustainable and environment polluting use of the land. These can be corrected by decentralized regulation and perhaps the damages can be restored from the resourced gained from the fines.

### Intermediate, mixed-rivalry tangible goods

We can find those private and public goods in this group which are parts of the engineering infrastructure, the communication system, the road system and the cultural inheritance. If the function of the cultural inheritance strong in the certain local space, the local identity and belongingness will be important, the economic and social interactions will improve, which encourage the economic growth.

### Private fixed capitals and toll goods

The private fixed capital belongs to this traditionally. The long term goal is to create such a regional environment that this capital type should stay and accumulate in the region. To reach this, several legal, social and economic conditions have to be available. The private capital will not transmigrate if the products produced in the region fit to the solvent demand of the region. To the toll goods belong all the goods that are owned by the society and charged with a rental fee and from this fee their amortization, maintenance and operation are paid.

### Social capital

Like at the approach of the other concepts, Camagni list the social capital to the intangible assets. This is collective and – as its name refers to – of social origin. This capital element gives cohesive strength and organizing policy in the region or even on the interregional level in the economy, institutional and social relation system. It includes the written and unwritten norms of the society, which affects intensity and quality of the interactions significantly influencing the economy. The social capital contributes to the improvement of the market efficiency as there is a need for the creation of the formal and informal communication channels to improve the innovative potential.



According to the author, the social capital can be economically quantifiable on the basis its effect on the space economic processes which manifests first of all in the trust appearing in the economic and social relations. If this trust exists between the characters, this creates such an advantageous economic milieu which makes the certain region even more attractive for the other companies.

Trust determines not only the every day life but the economic processes as well. (Hodosi 2011) In economics the function of the trust is to reduce administrative (costs originating from the collection of information which would be collected in the case too if it was not obligatory) and transactional costs (costs originating from the collection of information which is told to be obligatory by the law) if there is a trustful relationship between the economic organization and its partners. Trust makes it possible that there is no need for institutions dealing with enforcement of legal and ethical norms. Trust is formed easier in the special, socio-cultural proximity. Trust is such a cooperative attitude convention by which the suspicion decreases or disappears in the interpersonal relationship. Trust between the interpersonal and economic unity has price reducing function. One of its prominent and rare examples for this was the modern diamond merchantry where the Jewish merchants did not sign any contracts, they did not introduce administration with high costs but they completed the swap by shaking hands. This trustful nexus minimalized the costs connecting to the business processes. This business process is rare but represents the role of the trust in the economy.

All these can be true vice versa: if there is low level trust between the business partners the transactional and administrative costs are going to increase, which results in the loss of efficiency. In this case it is necessary to involve formal institutions which determine controls and if it is necessary to enforce the norms of the complicated contracts, the incidental litigious cases slow down the economic processes and innovation, the efficiency of production gets worse.

The determinants of the trustful relationship differ on micro- and mezo level. It is determined by four factors on the micro level: impressions at the personal appearance, the other partner's reputation, previous stereotypes, and whether the partner can be checked or not. Factors that are responsible for the evolvment and reproduction of the trustful relationship between companies: the history of the partnership of the company, the characters of the partner, the relationship of the management and the employees, the habits and attitude of the employees. Besides this the "structure of the company, the management form and the composition of the staff" are also important. (Hodosi 2011: 77)

We have to highlight that trust clears its costs not on a short term, but on a long term, this can be thought of as a strategic investment. As trust cannot be created, it has to be merited; its profit can be realized rather in a medium term or long-term. Even at the beginning of the relationship more costs appear at the foundation of the structure of trust. Let us think it over that to found, maintain the relationship costs money and time whose finance will have advantages only later (Tátrai 2003).

The economic function of trust can be analyzed from the aspect of the supply-demand. The coherence system can be recognized that has been described by the category of pure common-interest constructed by Schelling (1963). It means that “the pure common-interest includes the whole cooperative situation built on trust, which is characterized by the absolutely same goals and everybody has the same cost” (Hodosi 2011: 77).

### Relational capital

The relational capital is manifested in the cooperation of the economic characters which is determined by the efficiency of the information swap between them. The relational capital appears in three aspects: it reduces the distrust during the economic decisions, by the accumulation of the collective learning, lexical and non-lexical knowledge and experience the conditions of labour force conditions improve. Its third advantage is that in the regional collaboration the interaction between the economic characters shows improvement in quality, the strengthening of the informal relations means a common corporate system in the relations of globalization.

With the evolvement of such relations such local milieu is formed which can guarantee strategic economic advantages on the basis of the similar thinking, general ethics and language. Information circulation is faster in such a space structure which affects advantageously the market processes of the region. This organizes the collective activities of the local economic entities, it selects the unnecessary information during the economic decisions, and it can acquire knowledge and competencies adequate to the needs of the market. It is obvious the relation capital will return earlier at groups having higher livelihood.

### Human capital

According to the endogen growth theory the human capitals can have primer role in the regional economic processes, because it improves the local resources and attraction of the territory at the same time. The disposition of cooperation, the enterprising, creativity and the consultation between the characters of the market belong here.

### Agencies for the R&D transfers (agglomeration economies, connectivity and receptivity)

The social capital between the regional economic entities can be transformed into economic capital. Later from these bottom-up clusters can emerge those which can become the engines, determining elements of the economic growth. The more effective relations originating from the closeness, the urbanizing and agglomerating advantages can result in the improvement of the local enforcement of interest. It can be measured in the quickness and accuracy of the information swap. We can adjust to the constant changes in the structure of globalized world economy and we can form the changes for our advantage in the case if we form such mentality and attitude which makes us appropriate for openness.

### Cooperation networks

In the conceptual structure of Camagni this segment stands in the middle – not accidentally. The capital element standing in the center of the model integrates the assets being in private and public possession, and the material and intangible ones. On the certain territory the factors of the economic growth are structured by the cooperation networks, which – as one of its functions – has a redistributive function with the knowledge and the institution of R&D, in other words with the innovation potential. They take part in the correction of the failures of the market and the government (Stiglitz 2000).

### Relational private services

The economic entities can form relations by the spontaneity of the market mechanisms, but they can initiate consciously non-market based relations (for example with universities, research institutions) from which profit can be obtained on the territory.

## **3.2. My empirical results**

At macro-level the assets of territorial capital were increasing five years before economic depression, the its average growth was 0,53%. The first two years of crisis the average growth rate of the territorial capital was 0,89%, a 0,36 percentage point improvement. At Hungarian subregional level the growth of territorial capital was not stopping under the 2 years of economic depression, but marginally increased. In the first year of the economic crisis (2009), the territorial capital is relatively greatly went down, this was followed by a slightly correction in 2010. Comparing the rate of growth of territorial capital before and during economic crisis, it turns out that the

Hungarian subregions rate of accumulate of territorial capital fluctuated. The assets of territorial capital of Hungarian subregions were dynamic growing (it was a small decline in 2005 and it was stagnation in 2009) between 2004 and 2010. The highest rate of growth was between 2005 and 2006.

After standard deviation of measure, I examine the convergence of Hungarian subregions based on their territorial capital. This is my research question: is there convergence among subregions with high and insufficient endowment of territorial capital between 2004 and 2010? First step, I compared the 20 subregions with lowest endowment of territorial capital to the 20 subregions with highest endowment of territorial capital. My result show that average rate of growth of the 20 subregions with highest endowment of territorial capital were so high than the average rate of growth 20 subregions with lowest endowment of territorial capital. The average rate of growth of the 20 subregions with highest endowment of territorial capital were 4,83%, but the average rate of decrease of the 20 subregions with lowest endowment of territorial capital were 4,57%. There is difference between 9,58 percentage points. Finally, there was no convergence between conglomerates between 2004 and 2010.

I get another result, I compare the 40 subregions with highest endowment of territorial capital to the 40 subregions with lowest endowment of territorial capital. According to this, the average rate of growth of the 40 subregions with lowest endowment of territorial capital were 0,24%, but the average rate of decrease of the 40 subregions with lowest endowment of territorial capital were 2,26%. The trend was reversing in comparison to the previous one. The convergence can be shown in this constellation. However, the convergence can be shown that the position of subregions with high territorial capital were going down and the position of subregions with sufficient territorial capital were considerably rising. From 2004 till 2010 there was territorial convergence among Hungarian subregions because the 40 subregions with highest endowment of territorial capital were losing their original values.

The economic depression has little influence on the territorial capital of Budapest, capital of Hungary: its value of territorial capital 0,3826 to 0,3819 was decreasing. This reduction is considered negligible. In the second year of economic crisis, Budapest lost 9,65% of its territorial capital.

Finally, my last question is that: which types of capital defined the value of territorial capital between 2004 and 2010. I applied correlation analysis to the measurement of it. Its important result is regards to the Hungarian of the territorial capital structure. Interestingly, the territorial capital of Hungarian subregions were influenced by the relational capital and cultural capital and

the infrastructural capital and social capital defined slightest the territorial capital. Between 2004 and 2010 the territorial affect of intangible assets were so high in Hungary.

The territorial capital was growing in those subregions, which could integrate their relationships, cultural patterns and knowledge base into the regional economic processes. Those subregions could progress where enhanced the background of cultural economy.

### **3.2.1. New and novel scientific results**

(1) My doctoral dissertation has numerous theoretical and empirical results. As the paradigm of territorial capital was introduced into the modern regional studies (it is a short time in aspect of history of science), they scattered to find the approaches of definition in a lot of studies and study book. *In this doctoral dissertation I collect the theoretical backgrounds and approaches of the concept of territorial capital then, integrating these, all of it is interpreted and classified in logical framework.* No attempt has been made by an international or national scientific work so far.

(2) *The theme of empirical research and territorial level is novel in regards the Hungarian and international surveys.* The earlier surveys of territorial capital were cross-sectional studies, these based on usually database of 1999-2005). My research contains deeper and more information because it is a longitudinal study, examing the Hungarian subregions' territorial capital from 2004 till 2010. Thus I can understand and design the causal relationships as well (TÓTH T., 2010).

(3) My applied methodological system is completely new. I followed the traditional method of survey of territorial capital, I completed it a new method, it is called method of penalty for bottleneck. It is novel way, very new methodological process, nobody has applied it so far in the survey of territorial capital; I used this for the first time in this constellation. Practical application of the method is simple. Nobody has used it in the survey of territorial capital yet.

(4) I got a lot of new results will be used. I point out that the year 2009 was the toughest at macro-regional, the accumulate of territorial capital stopped. At macro-level the assets of territorial capital were increasing five years before economic depression, the its average growth was 0,53%. The first two years of crisis the average growth rate of the territorial capital was 0,89%, a 0,36 percentage point improvement. At Hungarian subregional level the growth of territorial capital was not stopping under the 2 years of economic depression, but marginally increased. In the first year of the economic crisis

(2009), the territorial capital is relatively greatly went down, this was followed by a slightly correction in 2010. Comparing the rate of growth of territorial capital before and during economic crisis, it turns out that the Hungarian subregions rate of accumulate of territorial capital fluctuated. *The assets of territorial capital of Hungarian subregions were dynamic growing (it was a small decline in 2005 and it was stagnation in 2009) between 2004 and 2010. The highest rate of growth was between 2005 and 2006.*

(5) I examine the convergence of Hungarian subregions based on their territorial capital. This is my research question: is there convergence among subregions with high and insufficient endowment of territorial capital between 2004 and 2010? First step, I compared the 20 subregions with lowest endowment of territorial capital to the 20 subregions with highest endowment of territorial capital. My result show that average rate of growth of the 20 subregions with highest endowment of territorial capital were so high than the average rate of growth 20 subregions with lowest endowment of territorial capital. The average rate of growth of the 20 subregions with highest endowment of territorial capital were 4,83%, but the average rate of decrease of the 20 subregions with lowest endowment of territorial capital were 4,57%. There is difference between 9,58 percentage points. Finally, there was no convergence between conglomerates between 2004 and 2010. I get another result, I compare the 40 subregions with highest endowment of territorial capital to the 40 subregions with lowest endowment of territorial capital. According to this, the average rate of growth of the 40 subregions with lowest endowment of territorial capital were 0,24%, but the average rate of decrease of the 40 subregions with lowest endowment of territorial capital were 2,26%. The trend was reversing in comparison to the previous one. The convergence can be shown in this constellation. However, the convergence can be shown that the positions of subregions with high territorial capital were going down and the positions of subregions with sufficient territorial capital were considerably rising. *From 2004 till 2010 there was territorial convergence among Hungarian subregions because the 40 subregions with highest endowment of territorial capital were losing their original values.*

(6) One of the biggest losers of the crisis became Budapest, *my survey of territorial capital showed that the Hungarian monocentric spatial structure begins to disintegrate.* The economic depression has little influence on the territorial capital of Budapest, capital of Hungary: its value of territorial capital 0,3826 to 0,3819 was decreasing. This reduction is considered negligible, but in the second year of economic crisis, Budapest lost 9,65% of its territorial capital.

(7) The Hungarian subregions' territorial capital is relatively constant. This is determined by the strongest relational capital and cultural capital (mainly tacit knowledge), I applied correlation analysis to the measurement of it. It important result is regards to the Hungarian of the territorial capital structure. Interestingly, the territorial capital of Hungarian subregions were influenced by the relational capital and cultural capital and the infrastructural capital and social capital defined slightest the territorial capital. *Between 2004 and 2010 the territorial affect of intangible assets were so high in Hungary.* The territorial capital was growing in those subregions, which could integrate their relationships, cultural patterns and knowledge base into the regional economic processes. Those subregions could progress where enhanced the background of cultural economy.

## **4. Conclusions and recommendations**

The dissertation deals with the dispersion, accumulation, rate of growth, convergence, inequality of Hungarian subregions' territorial capital. In addition, I examine factors which obstruct the growth of territorial capital in a longitudinal survey. My research contains deeper and more information because it is a longitudinal study, examining the Hungarian subregions' territorial capital from 2004 till 2010. Thus I can understand and design the causal relationships as well

The paradigm of territorial capital comes from the neoclassic endogenous growth of theory. It prefers supply-oriented approach, it accept and integrate that the region' material and intangible assets which contribute to the regional economic growth and development. Today, this is particularly necessary because financial capital is more limited available (because of the economic crisis). I formulate my conclusions and recommendations the framework of SWOT-analysis.

We must consider the results, means and methods of concept of territorial capital because there are a lot of intangible territorial assets among the determinants of regional processes and growth. This concept deals with these socioeconomic factors and it can quantify and measures. Thus the regional inequalities, convergence and growth can be operationalised by based on the interdisciplinary model.

The weakness of the model of territorial capital is that it provides such factors are not measurable, these are theoretically acceptable but immeasurable empirically. For example, CAMAGNI models emphasises local attitudes, mentality, special patterns of behaviour, these can be conceptualised but cannot be measured. We need primary research to measure these factors. ROTA (2010) performed this type of investigation but this research will require significant financial resources.

The concept of territorial capital has the potential opportunity. Those factors that have not previously been taken into account in the regional economic analysis (economic relational, social integration of firms, geographical location, trust, etc.) is that it significantly determine the regional growth. The combination of tangible and intangible capital and the integration of economic processes may contribute to the understanding of regional development. The paradigm of territorial capital can be applied well to the territorial situation analysis to find these regional elements which contribute the regional growth.



The threats of model of territorial capital are clear: following the strategies of the supply-oriented regional growth, a lot of infrastructural units can be created. If the industrial units choose the regions due to tax exemption, then investment in infrastructure is not return, because the firms stay in the region briefly. We need to realise that the unconditional support for foreign/home direct investments do not always produce long-term benefits, under certain circumstances it may be harmful (ENYEDI, 2010).

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